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Draft Generic Environmental Impact Statement

CASE 24-M-0433: In the Matter of the Rules and Regulations for the Environmental Review, Permitting, and Siting in this State of Major Renewable Energy Facilities and Major Electric Transmission Facilities Under the Renewable Action Through Project Interconnection and Deployment Act (RAPID Act)

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List of Acronyms and Abbreviations

AC	Alternating current
ACS	American Community Survey
ALJ	Administrative Law Judge
AQI	Air Quality Index
AREGCBA	Accelerated Renewable Energy Growth and Community Benefit Act
Article VII	New York Public Service Law article VII
Article VIII	New York Public Service Law article VIII
ASC	American Community Survey
bgd	Billion gallons per day
BOD	Biological oxygen demand
CAA	Clean Air Act
CAIDI	Customer Average Interruption Duration Index
CEA	Critical Environmental Area
CEF	Clean Energy Fund
CEHA	Coastal Erosion Hazards Areas
CES	Clean Energy Standard
CFR	Code of Federal Regulations
CGP	Construction General Permit
CGPP	Coordinated Grid Planning Process
CHPE	Champlain Hudson Power Express
CJWG	Climate Justice Working Group
CLCPA	Climate Leadership and Community Protection Act
CMP	Coastal Management Program
CO	Carbon monoxide
CO2	Carbon dioxide
Commission	Public Service Commission
Con Edison	Consolidated Edison Company of New York, Inc.
CP-29	NYSDEC Commissioner Policy 29 on Environmental Justice and Permitting
CP-42	NYSDEC Commissioner Policy 42 on Contact, Cooperation, and Consultation with Indian Nations
CGPP	Coordinated Grid Planning Process
CPCN	Certification of Environmental Compatibility and Public Need
CPNY	Clean Path NY
CRAMMP	Cultural Resources Avoidance, Minimization, and Mitigation Plan
CRIS	Cultural Resources Information System

CSA	Combined statistical area
CWA	Clean Water Act
DACs	Disadvantaged communities
DAM	Department of Agriculture & Markets
dBA	Weighted-decibel
DC	Direct current
DEFR	Dispatchable emissions free resources
DER	Distributed energy resource
DERMS	Distributed energy resource management system
DOS	Department of State
DOT	Department of Transportation
DPS	Department of Public Service
EAF	Environmental assessment form
ECL	Environmental Conservation Law
EDC	Electric distribution companies
EIA	U.S. Energy Information Administration
EIS	Environmental impact statement
EJ	Environmental justice
EMFs	Electric and magnetic fields
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EV	Electric vehicle
FAA	U.S. Federal Aviation Authority
FCZMA	Federal Coastal Zone Management Act
FERC	U.S. Federal Energy Regulatory Commission
FHWA	U.S. Federal Highway Administration
GEIS	Generic environmental impact statement
GETs	Grid-enhancing technologies
GHG	Greenhouse gas
GW	Gigawatts
GWh	Gigawatt-hours
HDD	Horizontal direct drilling
HPFF	High-pressure fluid-filled pipe
HPGF	High-pressure gas-filled pipe
HVAC	High voltage alternating current
HVDC	High voltage direct current
IOUs	Investor-owned utilities

JFK	John F. Kennedy International Airport
JTWG	Just Transition Working Group
kV	Kilovolts
kWh	Kilowatt-hours
Leq	Continuous sound level
LIPA	Long Island Power Authority
LL97	Local Law 97
LPC	Landmarks Preservation Commission
LWRP	Local Waterfront Revitalization Program
May Order	PSC Order on Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act (2020)
mG	Milligauss
mm	Millimeters
MSA	Metropolitan statistical area
MTA	Metropolitan Transportation Authority
MVA	Mega volt-amperes
MVT	Multi-value transmission
MW	Megawatts
MWh	Megawatt-hours
NAAQS	National Ambient Air Quality Standards
NCBP	Net Conservation Benefit Plan
NEPA	National Environmental Policy Act
NMFS	U.S. National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrous oxide
NPS	National Park Service
NRHP	National Register of Historic Places
NYCA	New York Control Area
NYCRR	New York Codes, Rules and Regulations
NYISO	New York Independent System Operator
NYNHP	New York Natural Heritage Program
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSEG	New York State Electric and Gas
NYSERDA	New York State Energy Research and Development Authority
NYSOPRHP	New York State Office of Parks, Recreation & Historic Preservation
O&R	Orange and Rockland

O_3	Ozone
OREC	Offshore Renewable Energy Certificates
ORES	Office of Renewable Energy Siting and Electric Transmission
OSHA	Occupational Safety and Health Administration
OTR	Ozone Transport Region
Pb	Lead
PEJA	Potential Environmental Justice Area
PM	Particulate matter
PM_{10}	Particulate matter that is 10 microns or less in diameter
$PM_{2.5}$	Particulate matter that is 2.5 microns or less in diameter
Port Authority	Port Authority of New York and New Jersey
Power Grid Study	DPS and NYSERDA Initial Report on the New York Power Grid Study (2021)
PPTN	Public Policy Transmission Need
PSC	Public Service Commission
PSL	Public Service Law
PURPA	Public Utilities Regulatory Policies Act
QFs	Qualifying facilities
RAPID Act	Renewable Action Through Project Interconnection and Deployment Act
RCRA	Resource Conservation and Recovery Act
REC	Renewable energy certificate
RES	Renewable Energy Standard
Resource Outlook	NYISO's 2023-2042 New York Resource Outlook
REV	Reforming the Energy Vision
REZ	Renewable Energy Zone
RG&E	Rochester Gas and Electric Corporation
RNA	Reliability Needs Assessment
ROW	Right-of-way
RPT	Real estate property taxes
RTE	Rare, threatened, and endangered species
SAIDI	System average interruption duration index
SAIFI	System average interruption frequency index
SASS	Scenic Areas of Statewide Significance
SCFF	Self-contained fluid-filled
SDWA	Safe Drinking Water Act
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Office
Siting Board	New York State Board on Electric Generation Siting and the Environment

SO_2	Sulfur dioxide
SPDES	State Pollutant Discharge Elimination System
SRHP	State Register of Historic Places
SSCs	Site-specific conditions
STATCOMs	Static synchronous compensators
T&D	Transmission and distribution
TAGMs	Technical and administrative guidance memorandums
the State	New York State
USACE	U.S. Army Corps of Engineers
USCs	Uniform standards and conditions
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Utility Study	Utility Transmission and Distribution Investment Working Group Report (2020)
VRMP	Visual Resources Management Plan
WTE	Waste-to-Energy
XLPE	Cross-linked polyethylene
ZEC	Zero-emissions credit

Executive Summary

In 2019, New York State (the State) enacted the Climate Leadership and Community Protection Act (CLCPA) with the objective of addressing climate change and minimizing its adverse impacts on the economic well-being, public health, natural resources, and the environment of the State. The CLCPA requires the State to reduce greenhouse gas (GHG) emissions to below 40 percent of 1990 levels by 2030 and 85 percent below 1990 levels by 2050 on an economy-wide basis. With respect to renewable generation, CLCPA also mandates that New York deliver 70 percent of its electric grid generation from renewable energy sources by 2030, with a longer-term target to reach zero-emissions electricity by 2040. To achieve these goals, the State has designed and implemented a series of policies, programs, and regulations to address key barriers and accelerate the transformation of the State's energy system.

The transition directed by the CLCPA requires upgrading the State's transmission system. In 2020, the Legislature recognized this need in the Accelerated Renewable Energy Growth and Community Benefit Act (AREGCBA), which directed the New York State Public Service Commission (PSC, or the Commission) and the State's electric utilities to identify transmission upgrades needed to meet CLCPA goals. The statute also directed preparation of the 2021 Power Grid Study, which assessed the potential scale of the necessary transmission investments. After consideration of the issues raised in the study, the PSC approved approximately six billion dollars in urgent transmission projects; programs to identify additional necessary transmission investments are under way.

The Legislature took further action in 2024 to expedite achievement of the CLCPA goals by enacting the Renewable Action Through Project Interconnection and Deployment Act (RAPID Act).[1] The legislation repealed former Executive Law § 94-c, which since its enactment in 2020 solely governed the siting of major renewable energy generation facilities, and replaced it with a new Public Service Law (PSL) § 3-c and a new PSL article VIII (Article VIII) to accelerate the siting of both major renewable energy facilities and major electric transmission facilities. The RAPID Act consolidates the environmental review, permitting, and siting of major renewable energy facilities and major electric transmission facilities under the purview of the Office of Renewable Energy Siting and Electric Transmission (ORES). The RAPID Act also authorizes ORES, in consultation with the Department of Public Service (DPS), and subject to approval by the Commission, to promulgate rules and regulations to implement a new siting permit program for major electric transmission facilities.

As required by the New York State Environmental Quality Review Act (SEQRA), this generic environmental impact statement (GEIS) analyzes the potential environmental impacts of the promulgation and approval of the new transmission siting regulations.

Chapter 1 describes the background, purpose and need, and public benefit of the proposed action, as well as the action's relationships to the State's other energy policies and programs. **Chapters 2-4** characterize the regulatory baseline against which the impacts of the proposed regulations are evaluated and compared. Specifically, **Chapter 2** provides an overview of the State's current electric energy industry. **Chapter 3** describes the environmental setting of this GEIS, which is the entire State of New York, including coastal waters within the State's jurisdiction. Potential impacts are assessed across 12 resource areas: physical geography; land use; water resources; climate change and air quality; plants and animals and species

[1] FY 2025 New York State Executive Budget 12673-01-4, Renewable Action Through Project Interconnection and Deployment ("RAPID") Act, 129-167.

biodiversity; aesthetic and visual resources; cultural and historic resources; waste management; public health; community character; transportation resources; and socioeconomic considerations.

Chapter 4 evaluates reasonable alternatives to the proposed action, including the baseline or "no action" scenario. Under the "no action" scenario, transmission siting would continue under the present PSL article VII (Article VII, Siting of Major Utility Transmission Facilities) regulations. The RAPID Act expressly preserves the Commission's existing transmission licensing authorities until Article VIII regulations become effective. Accordingly, if issuance of the new regulations were delayed or indefinitely postponed, upgrades and extensions of the transmission system would continue to be reviewed under the Article VII process.

Chapter 5 evaluates the environmental impacts that could arise from actions taken in response to the promulgation of rules and regulations necessary to implement the RAPID Act. The proposed action does not include any direct approval of applications for the siting of major electric transmission facilities. The Act is expected to expedite the review and permitting of such facilities in New York, but will not, by itself, change the number or location of transmission projects that will be needed to meet the electric system's needs and the State's policy objectives. In other words, it is highly likely that the same transmission projects would be completed after implementation of the RAPID Act as would be completed under the Article VII regulatory regime. Most of the direct and indirect effects of the actual future projects would therefore be similar under the proposed action and the "no action" alternative. The anticipated difference between the proposed action and the "no action" alternative would be the pace of permit approvals for the same portfolio of transmission projects. It is also conceivable that an accelerated permit process could lead to a higher rate of transmission construction and cumulative environmental impacts; however, it is not possible to evaluate that potential impact quantitatively due to the multiple factors that affect utility construction schedules.

Given these circumstances, and consistent with SEQRA regulations, this GEIS is broader and more general than a site- or project-specific environmental impact statement (EIS), and identifies potential areas where the construction, operation, and maintenance of transmission facilities may cause environmental impacts. This GEIS differentiates between the potential impacts of overhead, underground, and underwater transmission infrastructure. Overall findings suggest that direct adverse environmental impacts of the proposed action are likely to be minimal and that a variety of mitigation measures exist to minimize potential impacts.

The potential adverse environmental impacts resulting from transmission projects *generally* include: permanent forest clearing and vegetation removal; temporary and/or permanent disruptions to multiple ecosystems; increased sediment runoff and turbidity in water resources; displacement of wildlife and the introduction of non-native and invasive species; disruption of farming operations; aesthetic impacts due to the presence of transmission poles; and temporary traffic and noise, odor, and light impacts during construction phases. As noted above, these impacts would be similar under transmission siting procedures in the "no action" scenario; the new Article VIII regulations may, however, accelerate the realization of impacts.

As part of a broad suite of policies and initiatives designed to respond to multiple challenges facing the State's energy system, the RAPID Act may contribute to an accelerated transition to renewable energy in the State. Expedited approvals may accelerate the timeline of transmission projects themselves, allowing for timely connections to renewable energy sources. Similarly, expedited approvals may offer assurances and predictability to renewable energy developers awaiting project approval. Reducing the State's reliance on fossil fuels will in turn curtail climate change-inducing greenhouse gas (GHG) emissions, reduce criteria air pollutants, improve public health, and preserve natural resources. These benefits represent potential indirect and cumulative benefits of the proposed action.

Chapter 6 considers the measures available to minimize or avoid potential adverse environmental impacts that may result from implementation of the proposed action. The regulations implementing the RAPID Act provide

procedural and substantive requirements for applications for the siting of major electric transmission facilities and establish uniform standards and conditions (USCs) applicable to siting permits issued by ORES. The statute requires the regulations to ensure projects are constructed in a manner that avoids or minimizes, to the maximum extent practicable, significant adverse environmental and social impacts. Further, each application for a siting permit would undergo an individual, site-specific review by ORES in accordance with the procedural and substantive requirements of Article VIII and the proposed regulations with that same objective. Where USCs do not cover a particular issue on a specific project, ORES is authorized to design measures and impose site-specific siting permit conditions to reduce such site-specific or project-specific impacts.

Chapter 7 and **Chapter 8** consider, respectively, unavoidable impacts and irretrievable commitment of resources associated with the proposed action. Since the GEIS does not address site- or project-specific actions, there are no unavoidable adverse impacts or irreversible and irretrievable commitments of resources associated with the Article VIII regulatory program as a whole. A potential acceleration of transmission buildup in response to the proposed action may raise concerns about irreversible or irretrievable commitment of resources, but these will be identified in site-specific environmental analyses and avoided or minimized in accordance with Article VIII and other applicable laws and regulations.

Chapter 9 provides qualitative information on the potential growth-inducing aspects and socioeconomic impacts associated with implementing the proposed action. The RAPID Act by itself will not affect the volume or location of new transmission projects. Existing State climate and energy polices/legislation, namely the CLCPA and AREGCBA, together with basic infrastructure upgrades and utility capital plans, are the primary drivers behind the State's electric transmission and distribution (T&D) systems buildout. To the extent that the State's climate and energy policies influence this buildout, the underlying legislation and associated actions preceding the RAPID Act are the key factors. The proposed action, by accelerating development of the State's T&D systems, may contribute to growth-inducing and socioeconomic impacts such as increased electric system reliability and economic and employment growth. This chapter also describes the potential geographic distribution of such impacts, including consideration of environmental justice areas and disadvantaged communities.

Finally, **Chapter 10** considers the potential impacts of the proposed action on the use and conservation of energy, including the use of renewable energy sources. The proposed action will influence the use and conservation of energy in the State to the extent that it leads to the accelerated development of the State's T&D systems. However, the proposed action will not impact the demand for energy and will instead support the State's ability to meet such demand. This GEIS also addresses how the proposed action will contribute to the CLCPA's GHG emission reduction targets (section 7(2) of the law). The proposed action is a response to a legislative mandate. The New York State legislature designed the RAPID Act explicitly to timely achieve the renewable energy and GHG targets pursuant to the CLCPA.[2] Given the impacts and mitigation measures analyzed in this GEIS, implementing the regulations adopted under Article VIII is not inconsistent, and will not interfere, with the statewide GHG emission limits set by the CLCPA.

[2] *Ibid*.

CHAPTER 1 | SEQRA and Description of the Proposed Action

In 2019, New York State (the State) enacted the Climate Leadership and Community Protection Act (CLCPA) with the objective of addressing climate change and minimizing its adverse impacts on the economic well-being, public health, natural resources, and the environment of the State. The CLCPA requires the State to reduce greenhouse gas (GHG) emissions to below 40 percent of 1990 levels by 2030 and 85 percent below 1990 levels by 2050 on an economy-wide basis. With respect to renewable generation, CLCPA also mandates that New York deliver 70 percent of its electric grid generation from renewable energy sources by 2030, with a longer-term target to reach zero-emissions electricity by 2040. To achieve these goals, the State has designed and implemented a series of policies, programs, and regulations to address key barriers and accelerate the transformation of the State's energy system.

One key initiative involves upgrading the State's transmission system. In 2020, the Legislature recognized the need to expand the State's grid in the Accelerated Renewable Energy Growth and Community Benefit Act (AREGCBA), which directed the New York Public Service Commission (PSC, or the Commission) and the State's electric utilities to identify upgrades needed to meet CLCPA goals. The 2021 Power Grid Study assessed the potential scale of the necessary transmission investments. The PSC approved some $6 billion in urgent transmission projects after consideration of the issues raised in the study. The Legislature took further action in 2024 to expedite achievement of the CLCPA goals by enacting the Renewable Action Through Project Interconnection and Deployment Act (RAPID Act). The legislation repealed former Executive Law § 94-c, which since its enactment in 2020 solely governed the siting of major renewable energy generation facilities and replaced it with a new Public Service Law (PSL) § 3-c and a new PSL article VIII (Article VIII) to accelerate the siting of both major renewable energy facilities and major electric transmission facilities.

The RAPID Act consolidates the environmental review, permitting, and siting of major renewable energy facilities and major electric transmission facilities under the purview of the Office of Renewable Energy Siting and Electric Transmission (ORES). Among other things, the RAPID Act authorizes ORES, in consultation with the Department of Public Service (DPS) and subject to approval by the Commission, to promulgate rules and regulations to implement a new siting permit program for major electric transmission facilities. The proposed action under this generic environmental impact statement (GEIS) is the promulgation and approval of the new siting regulations.

The remainder of this chapter provides further background and context concerning the development of the GEIS. **Section 1.1** describes the purpose of New York's State Environmental Quality Review Act (SEQRA) and the requirement to prepare a GEIS for an action or plan that has a state-wide application. **Section 1.2** provides an overview of the public need, purpose, and substance of the regulations implementing the RAPID Act. **Section 1.3** provides a summary of the public benefits anticipated from the successful implementation of the proposed regulations. **Section 1.4** and **Section 1.5** describe, respectively, the geographic scope of the rulemaking and the RAPID Act's relationship with the State's other energy and climate programs. This chapter concludes by listing and describing all required approvals, reviews, and permits associated with implementing the proposed regulations.

1.1 Compliance with the New York State Environmental Quality Review Act

New York's SEQRA, codified at article 8 of the Environmental Conservation Law and its implementing regulations at 6 NYCRR part 617, declares that it is the State's policy to:

> "encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and enhance human and community resources; and to enrich the understanding of ecological systems, natural, human and community resources important to the people of the state."

The basic purpose of SEQRA is to incorporate the consideration of environmental factors into the planning, review, and decision-making processes of State, regional, and local government agencies at the earliest possible time. Consistent with this intent, SEQRA requires all State and local government agencies to analyze and mitigate potentially significant environmental impacts when deciding to approve or undertake an action. To accomplish this overarching goal, agencies are required to assess the environmental significance of all actions they have discretion to approve, fund, or directly undertake, unless exempt or excluded by statute or regulation. Compliance with SEQRA may include development of an environmental impact statement (EIS).

1.1.1 Preparation of a Generic Environmental Impact Statement

The first step in the SEQRA process is to complete an Environmental Assessment Form (EAF). The EAF is designed to assist State and local agencies in determining the environmental significance of an action based on an assessment of the proposed action, project location, purpose, potential outcomes, and potential impacts on the environment. Depending on this assessment, the agency then makes either a positive or negative declaration regarding the significance of the action. A negative declaration indicates that the proposed action would not have a significant adverse impact on the environment; a positive declaration indicates the potential for significant adverse impacts that require additional analysis and development of an EIS.

DPS, by and through ORES as lead agency, completed an EAF concerning the proposed action. ORES determined that the promulgation of rules and regulations to implement the RAPID Act may have a significant adverse impact on the environment, requiring preparation of an EIS. On October 1, 2024, ORES issued a positive declaration pursuant to SEQRA documenting this determination. Accordingly, this GEIS is being prepared pursuant to 6 NYCRR 617.10.

A GEIS is a type of EIS that is typically used to assess the environmental impacts of an entire program or plan having wide application, including new or significant changes to an agency's regulatory programs. The broader focus of a GEIS enables the lead agency to identify and broadly analyze the cumulative impacts of a group of actions or a combination of impacts from a single action. The fundamental elements of a GEIS are the same as the elements for a site-specific or project-specific environmental impact statement but provide broader review and general analysis of existing conditions and potential impacts.

In addition to meeting SEQRA requirements, this GEIS will include information required by CLCPA sections 7(2) and 7(3). These provisions require State agencies to consider whether their decisions are inconsistent with or will interfere with the attainment of the statute's statewide GHG reduction targets, and whether their decisions disproportionally burden disadvantaged communities as identified pursuant to the Environmental Conservation Law (ECL). This GEIS will include an analysis of the cumulative impacts, if any, associated with GHG related to the construction and operation of future transmission projects that would be subject to PSL article VIII. This analysis will also determine whether the promulgation and approval of the RAPID Act regulations comply with sections 7(2) and (3) of the CLCPA.

1.2 Background and Proposed Action

Consistent with 6 NYCRR 617.9(b)(5)(1), this section provides a concise description of: (1) the purpose and need for the RAPID Act, and (2) the proposed action (the promulgation of regulations) under the RAPID Act. This section is not intended to be an exhaustive or definitive discussion of the RAPID Act, but rather a targeted discussion of the Act for the purposes of the GEIS, as required under SEQRA.

1.2.1 Purpose and Need for the Regulations

The RAPID Act is part of a broader suite of policies and initiatives designed to respond to multiple challenges facing the State's energy system, many of which relate to the electric transmission and distribution (T&D) systems. The State's electric grid is the cornerstone of the economy and the public welfare. Since the early days of electrification, the PSL has required the State's electric utilities to provide safe and adequate service to customers. The utilities have and continue to build, operate, and maintain T&D infrastructure for these fundamental purposes. Many factors, including economic growth, changes in energy use patterns, and weather and climate events affect the need for and pace of T&D construction and repair projects.

In addition, changes to T&D systems are needed to respond to new policy directives. The CLCPA, by setting the State on a path to decarbonization, is an important driver of the need to upgrade the State's energy infrastructure. Both increases in electricity demand and the expansion of renewable energy supplies require changes to the grid. For example, according to the New York Independent System Operator (NYISO), transmission capacity connecting upstate regions to New York City is limited, and renewable facilities in some upstate regions have already curtailed generation due to transmission constraints.[3] A 2020 study commissioned by the PSC (Utility Transmission and Distribution Investment Working Group Report, or the Utility Study) divided local transmission and distribution projects into "Phase 1" and "Phase 2" projects. The Utility Study defined Phase 1 projects as those that are "immediately actionable projects that satisfy Reliability, Safety, and Compliance purposes but that can also address bottlenecks or constraints that limit renewable energy delivery within a utility's system."[4] Phase 2 projects comprise local transmission and distribution capacity upgrades that enable the interconnection of new renewable generation.[5] The PSC approved Phase 1 transmission projects estimated to provide 6,600 megawatts (MW) of capacity at a cost of $4.16 billion by 2024,[6] and Phase 2 projects estimated to provide 3,429 MW of capacity at a cost of $4.28 billion by 2030.[7]

The purpose of the RAPID Act is to consolidate and expedite the environmental review and permitting of the transmission projects required to meet all the needs of the system, with particular focus on major renewable energy facilities and major electric transmission facilities necessary to support the State's CLCPA goals. The new regulations are intended to implement these statutory objectives, while avoiding and minimizing environmental impacts to the maximum extent practicable, with consideration of all pertinent social, economic, and environmental factors in any permitting decisions.

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[3] NYISO. 2022. 2021-2040 System and Resource Outlook: A Report from the New York Independent System Operator. Accessed on October 10, 2024 at: https://www.nyiso.com/documents/20142/32663964/2021-2040_System_Resource_Outlook_Report_DRAFT_v15_ESPWG_Clean.pdf/99fb4cbf-ed93-f32e-9acfecb6a0cf4841.

[4] NYPSC. Case 20-E-0197. Utility Transmission and Distribution Investment Working Group Report. November 2, 2020. Accessed on November 26, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2794FC7E-D2A6-4C79-8834-4B60FA25ED1F}. Page 2.

[5] *Ibid*.

[6] NYPSC. Case 20-E-0197. Utility Transmission and Distribution Investment Working Group Report. November 2, 2020. Accessed on November 26, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2794FC7E-D2A6-4C79-8834-4B60FA25ED1F}. Page 5.

[7] *Order Approving Phase 2 Areas of Concern Transmission Upgrades*, NYPSC Case No. 20-E-0197 (February 16, 2023). Page 33.

1.2.2 Proposed Action

The proposed action under SEQRA is the promulgation of rules and regulations necessary to implement the RAPID Act as codified in PSL § 3-c and a new Article VIII. With respect to transmission, the RAPID Act provides for assessment and mitigation of environmental impacts related to major electric transmission facilities. The new Article VIII defines a "major electric transmission facility" as an electric transmission line of a design capacity of 125 kilovolts (kV) or more extending a distance of one mile or more, or of 100 kV or more and less than 125 kV, extending a distance of ten miles or more, including associated equipment, but shall not include any such transmission line located wholly underground in a city with a population in excess of 125,000 or a primary transmission line approved by the Federal Energy Regulatory Commission (FERC) in connection with a hydroelectric facility.

The RAPID Act specifically directs ORES to establish a set of uniform standards and conditions (USCs) for the siting, design, construction, and operation of major electric transmission facilities. The USCs must be designed to avoid, minimize, or mitigate, to the maximum extent practicable, any potential significant adverse environmental impacts that are common to the construction and operation of such facilities. This GEIS undertakes a comprehensive environmental review of the proposed USCs to assess whether they meet the above statutory standard.

The RAPID Act also directs ORES during its review of an application for a major electric transmission facility to identify those site-specific or project-specific adverse impacts, if any, that may be caused or contributed to by a specific proposed facility that are not addressed by the USCs. ORES is further directed to develop, in consultation with the New York Department of Environmental Conservation (NYSDEC), site-specific siting permit terms and conditions to address those impacts, taking into account CLCPA targets, the environmental benefits of the facility, and the public need for the facility. While the RAPID Act expressly exempts the review of specific applications from SEQRA, the project-specific permit application review conducted under Article VIII is intended to be at least as comprehensive as SEQRA. Accordingly, the use of the USCs together with any necessary site-specific siting permit terms and conditions imposed in the final siting permit will assure that the potential significant adverse environmental impacts associated with a specific major electric transmission facility are avoided, minimized, and mitigated, to the maximum extent practicable, taking into account the CLCPA targets, the environmental benefits of the facility, and the public need for the facility.

Concerning the siting of major renewable energy generation and electric transmission facilities, the RAPID Act also mandates additional requirements for farmland protections. The Department of Environmental Conservation's (NYSDEC's) freshwater wetland regulatory program also necessitates modification to ORES's current regulatory program governing freshwater wetlands for both generation and transmission projects. Finally, ORES is revising its renewable energy generation regulations to incorporate process improvements based on the office's experience in implementing the former 19 NYCRR part 900, now 16 NYCRR part 1100.

1.3 Public Benefits of Proposed Action

Consistent with 6 NYCRR 617.9(b)(5)(1), this section provides a concise description of the public benefits anticipated from the proposed regulations. The public benefits of the proposed regulations should be considered in comparison to the cost of the "business as usual" scenario in which current programs continue, and the electricity system develops as it would have absent the passage of the RAPID Act and promulgation of related regulations.

The proposed regulations are expected to yield public benefits through accelerating upgrades to existing infrastructure as well as development of new transmission infrastructure. Expedited investments in existing infrastructure will increase grid capacity and solve reliability and resiliency concerns faster than would occur absent the proposed regulations. A modernized grid will ensure New York businesses and residents continue to

receive highly reliable electric service and leverage opportunities for economic development at a reasonable cost.

Similarly, the proposed regulations will accelerate the construction of new electric transmission infrastructure to support renewable energy development in a timely manner, ensuring renewable energy projects in the State can come online and connect to the grid. A faster clean energy transition in the State would in turn accelerate improvements in environmental, public health, and other outcomes relative to actions in the regulatory baseline. In other words, though existing regulations promote similar public benefits, implementing the proposed regulations is intended to allow for earlier realization of these benefits.

1.4 Location of Action

The proposed regulations are intended to accelerate the path to meeting the State's renewable energy goals and ensure reliable electric service throughout the State. As such, the location of the action is the entire State of New York, including coastal waters within the State's jurisdiction, where either enhancement to the existing transmission system or new facilities may be needed.

1.5 Relationship to Other Plans and Programs

The proposed rulemaking is part of a broader suite of policies and initiatives undertaken by the State in order to ensure a just and timely clean energy transition. The State codified its overarching framework for achieving its clean energy goals in the CLCPA. The State's Accelerated Renewable Energy Growth and Community Benefit Act (AREGCBA) built on the CLCPA directives by requiring the State's utilities to identify and construct the transmission upgrades needed to achieve CLCPA goals. The RAPID Act seeks to accelerate those transmission projects and is directly related to the goals set out in the CLCPA.

In addition to the CLCPA and AREGCBA, the proposed rulemaking might interact with the State's other energy plans and programs, including:

- **Clean Energy Fund (CEF),** approved in 2016 and modified in 2021. The CEF consists of four program portfolios designed to collectively accelerate and expand investment in clean energy technologies:
    1) **Market Development** to reduce costs and accelerate customer demand for energy efficiency and other behind-the-meter clean energy solutions and increase private investment. This portfolio will provide financial support, technical knowledge, data, and education to customers and service providers to accelerate demand for clean energy solutions and will train an advanced workforce able to fill new jobs in the sector.
    2) **NY-Sun** to provide long-term certainty to New York's growing solar market and to lower the costs for homeowners and businesses investing in solar power. This portfolio aims to make solar energy more affordable and accessible for residential and commercial customers.
    3) **NY Green Bank** to partner with private financial institutions to accelerate and expand the availability of capital for clean energy projects. This portfolio will increase confidence in lending for clean technologies through a total investment of $1 billion.
    4) **Innovation and Research** to invest in technologies that will meet increasing demand for clean energy. This portfolio will drive clean tech business growth across five key opportunity areas: smart grid technology, renewables and DERs, high performance buildings, transportation, and cleantech startup and innovation development.
- **Reforming the Energy Vision (REV),** launched in 2014, is a comprehensive strategy that aims to remake the State's utilities to encourage the cleanest, most advanced, and efficient power system

operation through regulatory overhaul. REV is comprised of over 40 initiatives designed to support the clean energy transition, focusing on energy infrastructure modernization, clean energy financing, renewable energy generation, improving building and energy efficiency, building sustainable transportation, and innovation.

- **Clean Energy Standard (CES),** adopted in 2016 and expanded in 2020, is designed to fight climate change, reduce air pollution, and ensure a diverse and reliable low-carbon energy supply. By focusing on low-carbon energy sources, such as solar, wind, and hydropower, the CES aims to bring investment, economic development, and jobs to the State. The CES features two mechanisms – the renewable energy standard (RES) and zero-emissions credit (ZEC) requirement – that require every load serving entity to procure renewable energy certificates and zero-emissions certificates.

- **10-Point Action Plan,** announced by Governor Hochul in 2023, aims to expand and support the growing large-scale renewable energy industry in New York. The plan outlines a comprehensive set of actions being taken to lay the foundation for a sustainable future for all New Yorkers through the expansion of the State's growing clean energy economy and renewable energy sector. Under Action 5, New York is investing in and actively planning a historic buildout of transmission infrastructure across the state, including $4.4 billion in 62 local transmission projects to support clean energy integration in upstate areas; $4.1 billion in transmission upgrades to integrate offshore wind and increase reliability for Long Island and New York City; soliciting additional solutions to meet New York City's offshore wind transmission needs; and collaborating with other states and federal agencies on interregional transmission to reduce costs.[8]

- **Offshore Wind Master Plan 2.0,** launched by Governor Hochul in 2022, marked a new phase of offshore wind planning for the rapidly evolving industry, building on the work presented in Master Plan 1.0. In alignment with New York's 10-Point Action Plan, Master Plan 2.0 addresses the future of offshore wind development, including in deeper waters, and the potential for the expansion of the offshore industry and ability to meet regional development targets.

1.6 Approvals, Reviews, and Permits

The proposed action, which constitutes promulgation of regulations by the ORES, is subject to approval by the PSC. No other reviews or permits are required.

State agencies and authorities potentially interested and involved in the future implementation of the regulations include: New York State Office of Renewable Energy Siting and Electric Transmission, New York State Public Service Commission, New York State Department of Public Service, New York State Department of Environmental Conservation, New York State Department of Agriculture and Markets, New York State Department of Transportation, New York State Thruway Authority, New York State Division of Homeland Security and Emergency, New York State Office of Parks, Recreation and Historic Preservation, New York State Energy Research and Development Authority, New York State Department of State, and New York Power Authority.

[8] New York State. Governor Hochul Announces New 10-Point Action Plan to Expand the Renewable Energy Industry and Support High-Quality Clean Jobs in New York State. Accessed on October 10, 2024 at: https://www.governor.ny.gov/news/governor-hochul-announces-new-10-point-action-plan-expand-renewable-energy-industry-and.

CHAPTER 2 | The Electric Industry in New York State

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(ii) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter provides baseline information on New York State's (the State's) current electric energy industry. The background information presented in this chapter is intended to assist with understanding the potential impacts of the proposed action. **Chapter 3** provides information on the environmental setting, which serves as a baseline description of existing environmental conditions. Together, the information presented in **Chapter 2** and **Chapter 3** provides a baseline against which the impacts of the proposed regulations are evaluated in **Chapter 5** through **Chapter 10.**

This chapter is organized into the following seven sections:

- **Section 2.1** provides a short historical overview of the electric industry in the State;
- **Section 2.2** introduces the existing regulatory environment underlying the State's electricity industry;
- **Section 2.3** discusses historical trends in electricity demand;
- **Section 2.4** describes the present electric system, including the State's generation, transmission, and distribution systems;
- **Section 2.5** expands on the status of the State's transmission system, including the relevant permitting/planning processes and existing capacity constraints and reliability issues;
- **Section 2.6** describes the nature of the modifications and upgrades that will be required to provide service to customers in the future, including those needed to meet CLCPA objectives; and
- **Section 2.7** describes the current renewable energy generation program under the former Executive Law § 94-c, now Public Service Law article VIII (Article VIII), to provide context for changes to the program required by the RAPID Act with respect to impacts to agricultural and wetland resources.

2.1 History of the Electric Industry

The structure of the power system has remained relatively unchanged since the first grid in 1879.[9] Generation units inject power onto high-voltage transmission lines that carry electricity to load centers, where substations step down the voltage such that electricity can be safely delivered to customers through the local distribution system. For most of the 20th century, investor-owned utilities (IOUs) owned both the generation plants and transmission assets as exclusive operators, procuring and delivering power under the regulatory oversight of state commissions. In New York, the Public Service Commission (PSC, or the Commission) regulated the State's seven IOUs and the rates charged to consumers.

The Arab oil embargo of 1973, which resulted in a fourfold increase in oil prices, catalyzed a major restructuring of the electricity sector in the United States.[10] The oil embargo, along with the subsequent energy price volatility, caused electricity rates to rise so sharply that, in 1982, electricity demand declined for the first time since World War II.[11] President Carter and Congress enacted a number of changes to combat rising prices, promote energy efficiency and conservation, and incentivize competition in power generation. Notably, the

[9] Bakke, G. A. 2017. The Grid: The Fraying Wires Between Americans and Our Energy Future. Bloomsbury. Page 27.

[10] Willrich, M. 2017. Modernizing America's Electricity Infrastructure. The MIT Press. Page 25.

[11] *Ibid.*, at 26.

Public Utilities Regulatory Policies Act (PURPA) of 1978[12] enabled third-party power producers to sell electricity from qualifying facilities (QFs), defined as renewable energy sources 80 megawatts (MW) or less.[13] Independent power production emerged from PURPA, offering a new model for electric generation based on competition rather than vertical integration.

New York State embraced the development of the competitive wholesale electric market, and in 1996 the PSC issued an order requiring the State's IOUs to unbundle their generation, transmission, and distribution assets.[14] The order forced the utilities to divest their generation units, enabling independent power producers to purchase them and compete in an energy market.[15] IOUs retained ownership of their distribution and local transmission systems but were no longer vertically integrated.

At the same time, federal deregulatory policy led to the formation of the New York Independent System Operator (NYISO), a not-for-profit organization responsible for operating the transmission system and administering a market for wholesale electricity. NYISO's auction platforms have facilitated New York's competitive wholesale electricity market since 1999.[16] As the sole administrator in New York, NYISO determines the operating procedures and market design of the wholesale energy market. Additionally, NYISO controls the flow of electricity across the bulk transmission system in real time, dispatching generation resources as needed to cost-effectively meet electricity demand. The State's six IOUs (Central Hudson Gas & Electric, Consolidated Edison, Niagara Mohawk Power, New York State Electric & Gas, Rochester Gas & Electric, and Orange and Rockland) and the Long Island Power Authority (LIPA) continue to own and maintain the transmission and distribution grids serving New York customers.[17]

In recent years, State climate policies have begun to transform the State's electric generation supply, shifting the system away from dependence on fossil fuels towards an emissions-free supply portfolio. A 2004 PSC order approved a Renewable Portfolio Standard that required renewables to supply 25 percent of New York's energy by 2013.[18] The PSC later raised the target in its Clean Energy Standard order to 70 percent by 2030.[19] In 2019, the CLCPA set targets for carbon-free electricity by 2040 and an 85 percent reduction in economy-wide emissions by 2050.[20]

2.2 Regulatory Environment

New York State's electric industry is subject to regulation at different levels. The Federal Energy Regulatory Commission (FERC) regulates interstate electricity transmission and wholesale markets as well as the transmission and interstate sale of natural gas.[21] FERC approves NYISO tariffs, oversees national reliability standards, and sets rates for wholesale electricity and transmission.

The NYISO monitors the real-time electricity supply to ensure the reliability of electric service at the lowest feasible cost. Through its annual grid assessments, NYISO plays a pivotal role in planning, in particular with

[12] Bakke, G. A. 2017. The Grid: The Fraying Wires Between Americans and Our Energy Future. Bloomsbury. Page 86-87.

[13] Willrich, M. 2017. Modernizing America's Electricity Infrastructure. The MIT Press. Page 27.

[14] *Opinion and Order Regarding Competitive Opportunities for Electric Service*, NYPSC Case No. 94-E-0952 (May 20, 1996).

[15] *Ibid*.

[16] *Ibid.*

[17] PSEG-Long Island operates and maintains the LIPA transmission and distribution system.

[18] NYSERDA. Renewable Portfolio Standard. Accessed on November 25, 2024 at: www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard/Clean-Energy-Standard-Resources/Renewable-Portfolio-Standard.

[19] NYSERDA. Clean Energy Standard. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard.

[20] New York State Climate Action Council. 2022. "New York State Climate Action Council Scoping Plan." Accessed on November 25, 2024 at: https://climate.ny.gov/-/media/Project/Climate/Files/NYS-Climate-Action-Council-Final-Scoping-Plan-2022.pdf. Page 1.

[21] Federal Energy Regulatory Commission. What FERC Does. Accessed on November 25, 2024 at: https://www.ferc.gov/what-ferc-does.

respect to the reliability of the bulk electric system. NYISO also administers the interconnection rules under which new generation and transmission is integrated with the existing grid, and NYISO has a role in evaluating transmission projects that serve public policies identified by the PSC. NYISO is regulated by FERC.

The PSC regulates New York's electric, gas, steam, telecommunications, and water utilities. The PSC reviews the electric utilities' plans and proposes capital investments, and approves funding for the construction, repair, and maintenance of transmission and distribution facilities through electric rates. The PSC also has responsibility under PSL Article VII for certifying new transmission facilities. The New York State Board on Electric Generation Siting and the Environment (Siting Board) had responsibility for certifying new generation facilities pursuant to Public Service Law article X until AREGCBA's passage in 2020 that vested approval of large scale renewable generation facilities in ORES.As discussed below, the RAPID Act vests permitting authority for the siting of both renewable energy generation facilities and transmission facilities in the Office of Renewable Energy Siting and Electric Transmission (ORES), now part of the Department of Public Service (DPS).

The State's utilities own the distribution and local transmission systems. They are responsible for providing safe and adequate service to customers under the PSL and their PSC-approved tariffs.

2.3 Trends in Electricity Demand

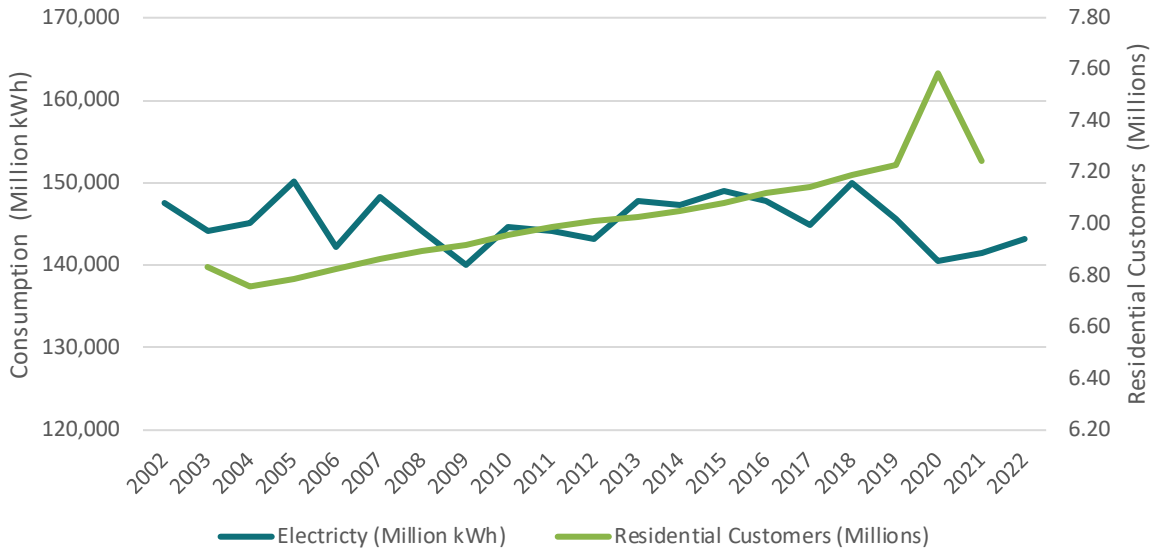
Throughout the 20th century, electricity consumption steadily increased across the United States as the country's population increased. This demand growth plateaued in the early 21st century due to energy efficiency improvements and changes in the industrial base. Electricity consumption in New York State mirrors national trends. In 2022, New York consumed 143 million megawatt-hours (MWh) of electricity, nearly three percent less than 2002 levels.[22] Consumption declined despite six percent growth in residential customers and 18 percent growth in commercial customers between 2003 and 2021.[23] **Figure 2-1** illustrates the reduction in New York energy consumption as the number of residential customer connections increased. Energy efficiency investments, which significantly reduced electricity consumption per capita, are a primary factor for the decline.[24] Shifting economic conditions also reduced industrial energy demand, further impacting overall electricity consumption.

[22] EIA. New York. Accessed on November 25, 2024 at: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_use/tx/use_tx_NY.html&sid=NY.

[23] NYSERDA. 2023. Patterns and Trends: New York State Energy Profiles, 2007-2021. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/2023-Appendix-F-PatternsandTrendsEAA2007-2021.pdf.

[24] EIA. 2017. Per capita residential electricity sales in the U.S. have fallen since 2010. Accessed on November 25, 2024 at: https://www.eia.gov/todayinenergy/detail.php?id=32212.

Figure 2-1. Total State Electricity Consumption and Residential Customers in New York[25, 26]



However, New York's CLCPA is expected to increase the State's electricity demand because of the law's requirements to decarbonize the grid. Meeting CLCPA targets requires, among other actions, electrifying different sectors of the economy, such as heating and transportation, thus adding to the demand for electricity. NYISO's 2023-2042 New York Resource Outlook (Resource Outlook) estimates that electricity consumption in the State will increase by between 50-90 percent over the next twenty years.[27] Meeting that demand will require 100 to 130 gigawatts (GW) of installed generation capacity.[28] As of July 2023, New York had 40 GW of capacity, including imports, most of which are not renewable sources of energy.[29] **Figure 2-2** displays NYISO's high demand energy forecast through 2053 in gigawatt-hours (GWh), accounting for economic growth and increased demand due to electrification of buildings and transportation.

[25] EIA. New York. Accessed on November 25, 2024 at: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_use/tx/use_tx_NY.html&sid=NY.

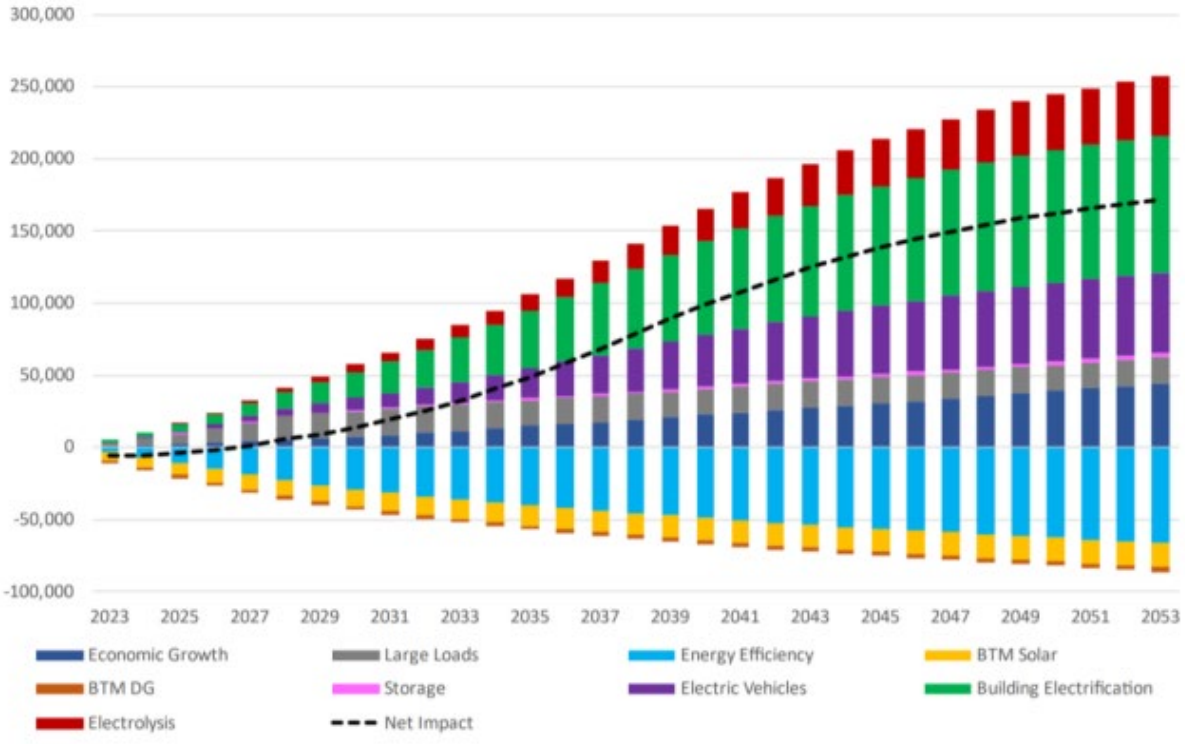
[26] NYSERDA. 2023. Patterns and Trends: New York State Energy Profiles, 2007-2021. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/2023-Appendix-F-PatternsandTrendsEAA2007-2021.pdf.

[27] NYISO. 2024. 2023-2042 System & Resource Outlook. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf. Page 5.

[28] *Ibid.*, at 10.

[29] *Ibid.*, at 75.

Figure 2-2. NYISO Resource Outlook High Demand Scenario (GWh)[30]



As the CLCPA is implemented, New York's transmission and distribution systems must integrate significant new renewable capacity and accommodate the forecasted growth in electricity demand without compromising reliability.[31] The twin challenges of electrification and replacing fossil energy with renewable resources require changes to the transmission system. In recognition of this, and to support the transition to a zero-emissions system, the State passed the Accelerated Renewable Energy Growth and Community Benefit Act (AREGCBA) in 2020. This law required the PSC and the utilities to identify the investments that will be needed in the electric grid to support CLCPA goals.[32] In response, the PSC has approved a number of near-term transmission upgrades and initiated a state-wide planning process to identify the investments that will be needed on a longer time scale.[33]

The RAPID Act aims to accelerate this buildout of the transmission upgrades that are needed to support a decarbonized system.

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[30] *Ibid.*, page 32.

[31] The CLCPA forecasts that electricity demand increases by 100-110 percent by 2050. *Ibid.*, at 220.

[32] FY 2021 New York State Executive Budget. S. 75-9-B, A. 9508-B. "Accelerated Renewable Energy Growth and Community Benefit Act". Accessed November 25, 2024 at: https://nyassembly.gov/2020budget/2020budget/A9508b.pdf.

[33] NYPSC. Case 20-E-0197. Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-e-0197&CaseSearch=Search.

Also see orders issued by the Coordinated Grid Planning Working Group: https://dps.ny.gov/coordinated-grid-planning-working-group.

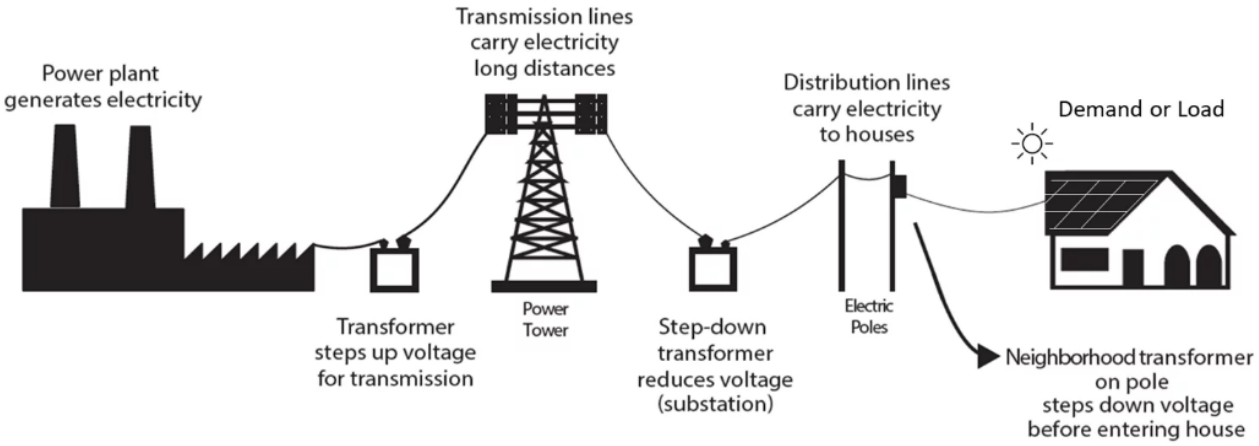
2.4 The Present Electric System

This section provides more information on each component of the electrical system in the State: generation, transmission, and distribution.

- **Generation** consists of generating units and associated facilities, including step-up transformers, controls, generation leads, and switch gear that transports power to the transmission system. Generation sources are located across the State.
- The **transmission** system includes the local and bulk transmission of power from generation units to substations, which step voltage down to levels used on the distribution system. Transmission lines operate at high voltages (typically above 69 kilovolts, or kV) and deliver power within and across State lines.
- The **distribution** system operates at lower voltage levels and delivers electricity from substations to customer end-users. It is primarily composed of distribution wires, cables, poles, substations, regulators, meters, and capacitor banks. The distribution system is increasingly connected to residential devices, vehicles, and distributed energy resources through smart meters.

These three components operate in harmony to form the electrical grid.

Figure 2-3. Electric Grid Components[34]



2.4.1 Generation

This section provides an overview of the existing electricity generation system serving the State, including a description of existing power plants and capacity, as well as planned generation projects and projected capacity.

2.4.1.1 Current Generation Profile

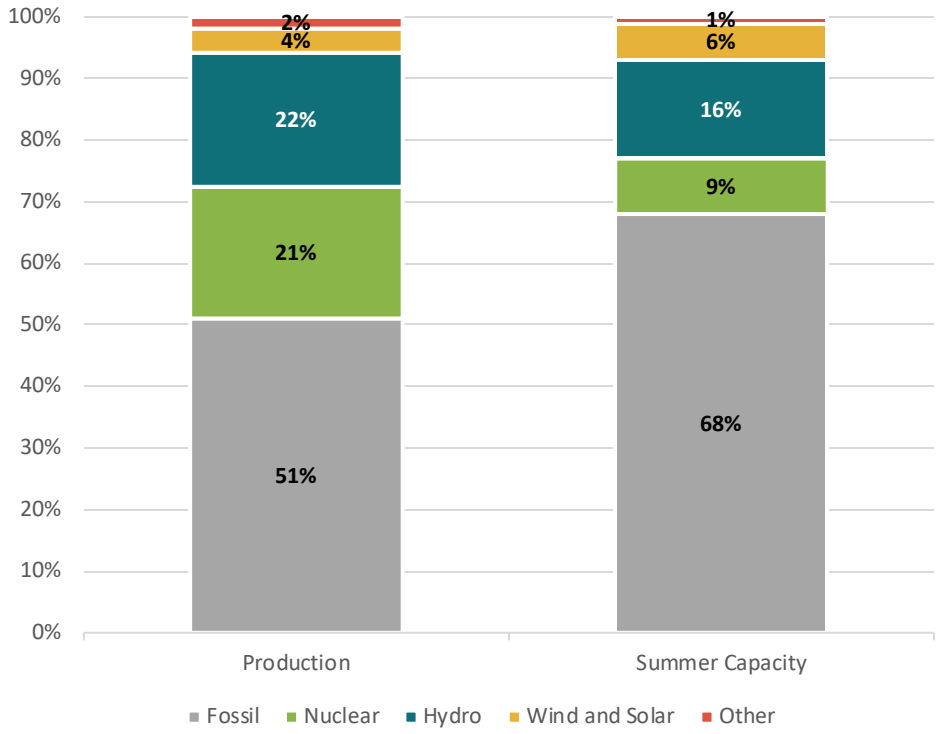
Generating plants sell their power in the NYISO-managed markets or to wholesale customers through bilateral contracts. Developers build new generation and infrastructure needed to interconnect their assets to the transmission system, including transformers, cables, controls, generation leads, and switch gear. The New York Power Authority (NYPA) is the largest generation owner in New York, providing 25 percent of the New York

[34] Stanford University. The Grid: Electricity Transmission, Industry, and Markets. Accessed on November 25, 2024 at: https://understand-energy.stanford.edu/energy-currencies/electricity-grid.

Control Area's (NYCA's) power from a portfolio of 16 generation facilities, including three large hydro-electric plants and 1,400 miles of transmission lines.[35]

Fossil fuels are the largest sources of electricity generation in the NYCA, accounting for 49 percent of electricity production in 2023 and 68 percent of capacity.[36] Wind and solar combined generate approximately four percent of electricity and provide seven percent of summer capacity.[37] Between 2011 and 2023, nuclear generation declined from 31 percent of generation to 22 percent of total production.[38] Fossil generation (predominantly natural gas-fired power plants) has replaced the lost nuclear production, leading fossil generation to increase from 45 percent of generation to 49 percent during the same period.[39] Wind and solar generation have doubled in the last decade and now make up approximately four percent of overall NYCA production. NYCA is also a net importer of electricity, roughly a third of which is carbon-free hydroelectricity from Quebec.[40] The 2023 NYCA Energy Mix is displayed below in **Figure 2-4.**

Figure 2-4. 2022 NYCA Energy Mix Excluding Imports[41]



[35] NYPA. The New York Power Authority. Accessed on November 25, 2024 https://www.nypa.gov/about/the-new-york-power-authority.

[36] NYISO. 2024. 2024 Load & Capacity Data. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2226333/2024-Gold-Book-Public.pdf. Pages 110-111.

[37] *Ibid.*

[38] NYISO. 2016. 2012 Load & Capacity Data. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2226467/2012-Load-Capacity-Data-Report-Gold-Book.pdf/1bcd092d-818c-6ce5-3338-bda2517661ed. Page 53.

[39] *Ibid.*

[40] NYISO. 2024. 2024 Load & Capacity Data. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2226333/2024-Gold-Book-Public.pdf. Page 108.

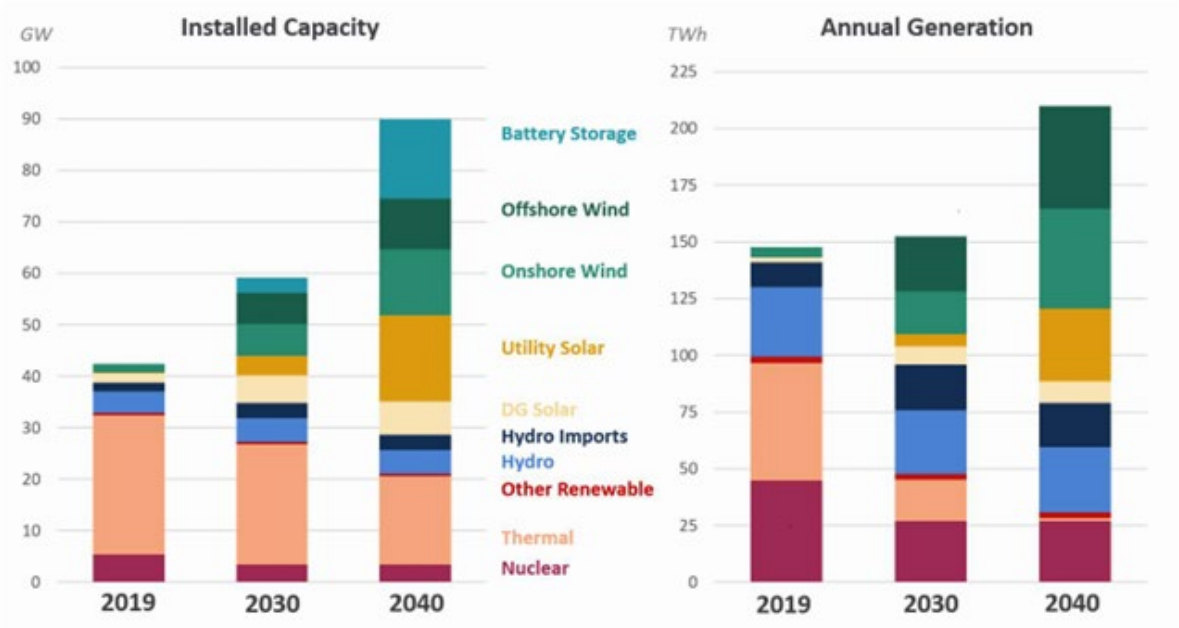
[41] *Ibid.*, at 109-110.

2.4.1.2 Generation Needs to Achieve CLCPA Targets

The CLCPA set specific renewable capacity targets that will transform New York's generation mix: 70 percent carbon-free electricity by 2030, and 100 percent carbon-free electricity by 2040. Achieving the nine GW offshore wind goal would increase current renewable capacity roughly four-and-a-half-fold. Similarly, while summer solar capacity accounted for only 254 MW in 2023,[42] the CLCPA targets 3,000 MW by 2030.

The DPS and New York State Energy Research and Development Authority (NYSERDA) Power Grid study indicates that considerable capacity additions are required in the short term (displayed in **Figure 2-5** below) and that current investments in transmission can enable the necessary renewables at low levels of curtailment and congestion.[43] The coordination of new generation with storage and transmission development is a key factor in the study, and the authors stress that coordination efforts must overcome the separate transmission and generation procurement processes.[44]

Figure 2-5. Zero Emissions Study Initial Scenario[45]



The NYISO Resource Outlook also concludes that NYCA requires significant capacity additions. The report emphasizes the role of dispatchable emissions free resources (DEFR), which include long-duration batteries, small modular nuclear reactors, hydrogen powered generators, and fuel cells.[46] NYISO forecasts that such resources will be critical beyond 2030 and emphasizes that the interconnection of new generation is dependent

[42] *Ibid.*, at 3.

[43] The analysis assumes a new HVDC line to New York City. New York Department of Public Service. 2021. Initial Report on the New York Power Grid Study. Accessed on November 25, 2024 at: www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/NY-Power-Grid/full-report-NY-power-grid.pdf. Page 79.

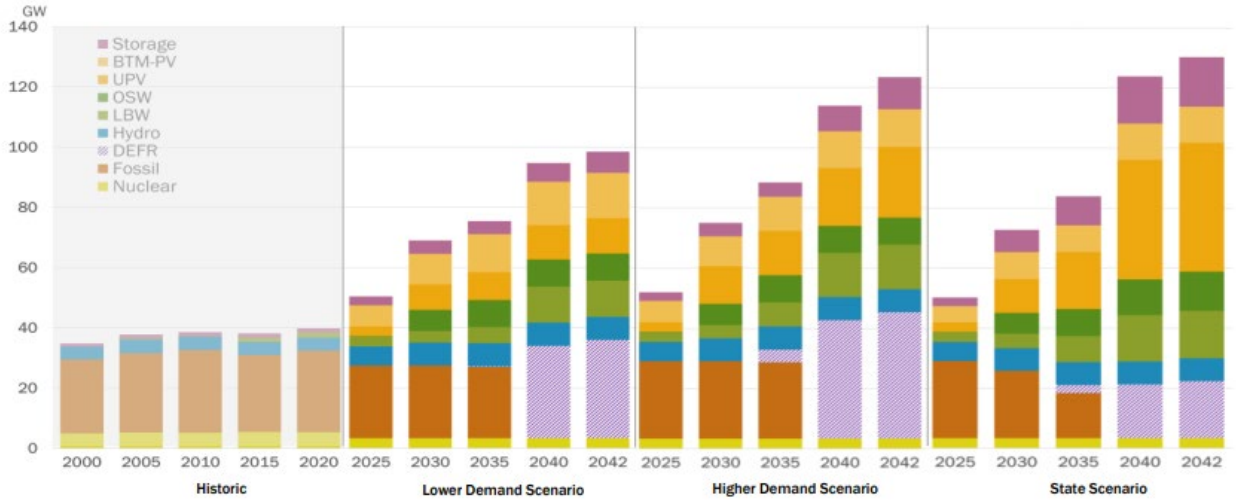
[44] *Ibid.*, at 88.

[45] *Ibid.*, at 80. The Initial Scenario reflects the assumption made in the High Technology Availability Pathway from a deep decarbonization pathway report commissioned by NYSERDA (See: Pathways to Deep Decarbonization in New York State by E3). The pathway emphasizes energy efficiency, electrification, alternative fuels, carbon capture, and storage, The report began prior to the passage of the CLCPA but pathway outcomes are generally aligned with CLCPA targets.

[46] NYISO. 2024. 2023-2042 System & Resource Outlook. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf. Pages 8-9.

on the timely construction of planned transmission upgrades.[47] **Figure 2-6** illustrates multiple scenarios that predict rapid uptake of DEFR after 2035. The figure includes NYISO's low demand and high demand scenarios (described in Section 2.3),[48] and the "State Scenario" which models inputs from NYSERDA and DPS to support the Coordinated Grid Planning Process.

Figure 2-6. NYISO Resource Outlook Installed Capacity by Scenario[49]



Several factors indicate that renewable energy sources will account for a larger share of NYCA's generation mix over the next decade. First, certain policy mechanisms support development of renewables, including the renewable energy certificate (REC) program. The State's Clean Energy Standard requires electricity distribution companies to procure RECs, which are the attributes of generation produced by eligible renewable energy technologies.[50] Distribution companies are required to purchase RECs to comply with annual obligations set by the PSC.[51] Eligible Tier 1 REC technologies include: fuel cells, hydroelectricity, geothermal, solar photovoltaics, tidal and wave energy, onshore wind, and offshore wind. Tier 2 RECs are broken into two programs: (1) a Maintenance Resource REC program supports existing hydroelectric, biomass, and wind turbine facilities that are 10 MWs or less; and (2) a Competitive Program that is a modified version of the Tier 1 program for wind and hydroelectric resources built prior to 2015.[52] Tier 4 RECs, discussed further in Section 2.5.3, provide financial support for transmission projects delivering renewable energy. REC sales to utilities directly support the competitiveness of renewables and incentivize new developers to enter the NYCA market.[53,54]

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[47] *Ibid.*, at 18.

[48] The high demand scenario displayed in Figure 2-6 relies on the same assumptions as those in Figure 2-2.

[49] *Ibid.*, at 43.

[50] NYSERDA. 2024. New York State Clean Energy Standard RES Tier 1 Certification: Submission Instructions and Eligibility Guidelines. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Clean-Energy-Standard/Eligibility-Certification-Guidelines.pdf. Page 12.

[51] *Order Adopting Modifications to the Clean Energy Standard*, NY PSC Case No. 15-E-0302 (October 15, 2020).

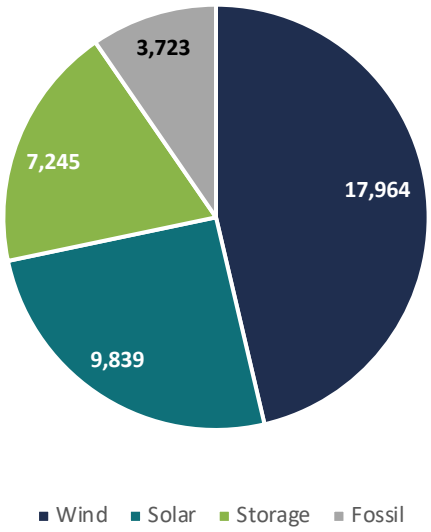
[52] *Ibid.*

[53] Energyby5. 2024. Understanding RECS in New York 2024. Accessed on November 25, 2024 at: https://www.energyby5.com/understanding-recs-in-ny-2024.

[54] NYSERDA. 2024 Compliance Year. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard/LSE-Obligations/2024-Compliance-Year.

Second, the transmission interconnection queue suggests progress towards developing needed renewable generation. The NYISO interconnection queue shows new projects proposing to connect to the transmission system in New York. As displayed in **Figure 2-7** below, the capacity of solar projects in the pipeline exceeds the 6,000 MW by 2030 CLCPA target, and the pipeline of wind projects totals nearly 18,000 MW. Additionally, fossil sources of generation only account for 10 percent of proposed interconnection capacity.[55] The costs of upgrades identified through interconnection technical studies and the length of the interconnection process have historically resulted in high rates of project cancellation, but reforms to the interconnection process pursuant to FERC Order 2023 are anticipated to accelerate interconnection of new projects.[56] The current composition of the queue indicates that accelerated interconnection will predominantly benefit clean energy sources.

Figure 2-7. Interconnection Queue Summer Capacity (MW)[57]



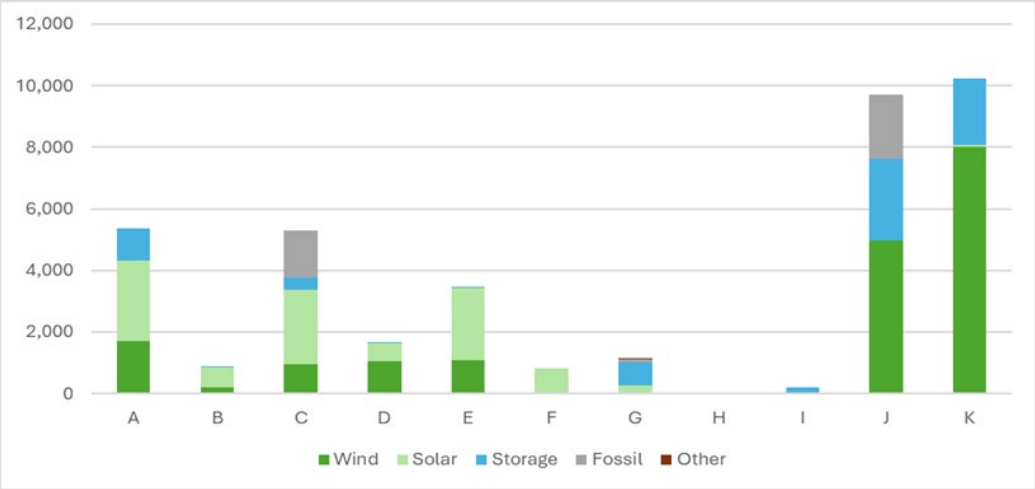
Third, half of the 35,000 MW of solar, wind, and storage in the interconnection queue seeks to supply power to the New York City and Long Island regions. Interconnecting resources directly to these load centers is critical to reducing renewable curtailments and congestion costs. Moreover, these new resources enable the eventual retirement of fossil plants in southern New York. The NYISO Interconnection queue (**Figure 2-8**) illustrates the renewable interconnection potential to New York City (Zone J) and Long Island (Load K).

[55] NYISO. Interconnection Queue 11-2-2020. Data retrieved October 7, 2024 from: https://www.nyiso.com/documents/20142/1394430/NYISO-Interconnection-Queue-11-19-20.xlsx/b5d2d932-225a-10e6-5b45-075acb4fb4a9?t=1608559880214.

[56] Federal Energy Regulatory Commission. 2023. Order no. 2023. Accessed on November 25, 2024 at: https://www.ferc.gov/media/order-no-2023.

[57] *Ibid*.

Figure 2-8. NYISO Interconnection Queue by Zone[58]



2.4.2 Transmission System

The transmission serves two main functions: to integrate generation and to serve load, primarily at the distribution level. Bulk transmission lines can traverse multiple utility service areas to transport energy across regions to load centers. The State's transmission grid comprises over 11,000 miles of transmission lines. When transmission reaches load centers, substations step down the voltage to safely deliver electricity to the distribution system, which operates at lower voltages. In some cases, transmission lines deliver directly to industrial customers.

Upgrading the transmission system is key to relieving electricity congestion and ensuring that renewable energy is available to meet demand. When the grid is too constrained to deliver electricity generation to load, system operators will reduce or curtail the excess energy production to avoid overheating equipment and causing failures. Renewable resources located in constrained areas of the system are often curtailed during periods of congestion, increasing electricity costs to consumers and reducing the availability of renewable energy. Upgrades are also needed to serve higher demand arising from CLCPA electrification requirements.

2.4.3 Distribution System

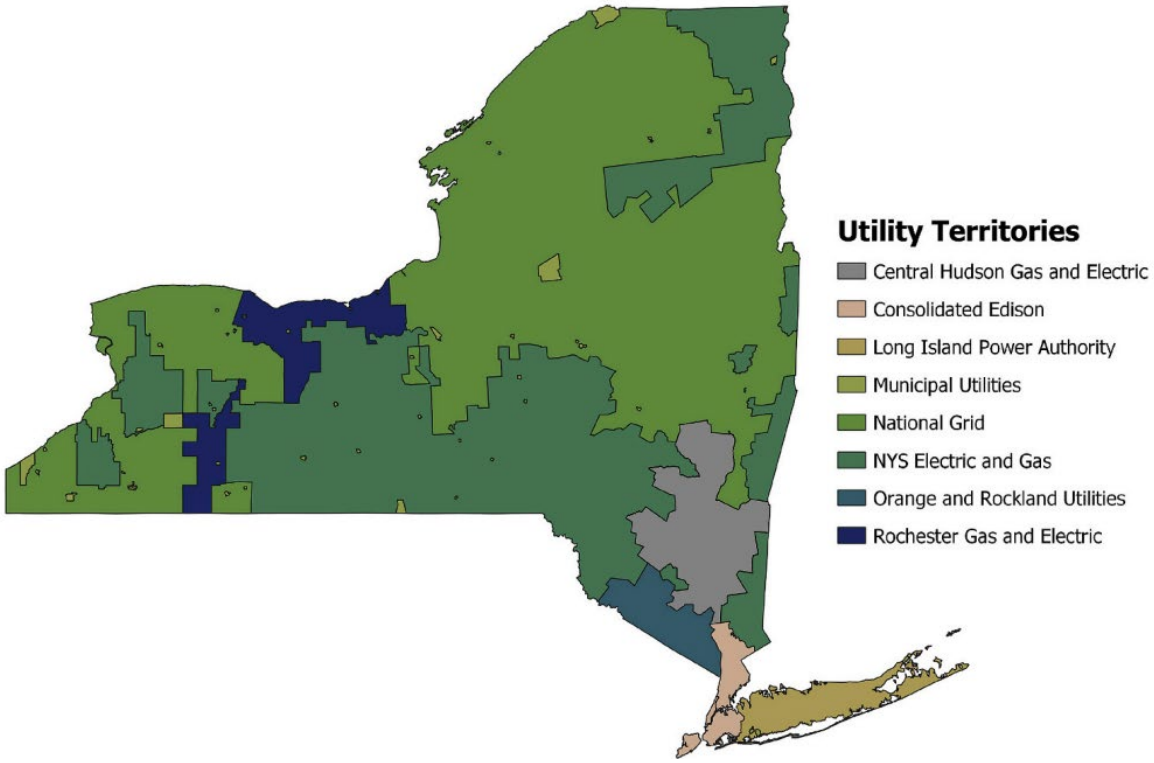
2.4.3.1 Distribution System Modernization

Electric distribution companies (EDCs), namely IOUs, municipal utilities, and the Long Island Power Authority (LIPA), will continue to play an integral role in ensuring adequate service and grid reliability as the State pursues its climate goals. EDCs manage the local transmission and distribution systems, directly serving New York customers. In evaluating the need for transmission expansion, it is important to consider distribution. Additionally, concentrated amounts of generation at the distribution level may require transmission upgrades to avoid curtailment.

[58] NYISO. Interconnection Queue 11-2-2020. Data retrieved October 7, 2024 from: https://www.nyiso.com/documents/20142/1394430/NYISO-Interconnection-Queue-11-19-20.xlsx/b5d2d932-225a-10e6-5b45-075acb4fb4a9?t=1608559880214.

EDCs own roughly 125,000 miles of distribution lines in New York, 14 percent of which are underground.[59] In addition to delivering power, EDCs are responsible for customer services, including metering, billing, and maintenance. **Figure 2-9** maps the service territories of EDCs operating in New York.

Figure 2-9. New York EDC Territories[60]



EDCs facilitate distributed energy resource (DER) integration with the distribution system. DERs are small-scale energy resources that inject energy onto the distribution system, such as small solar power generators. To integrate these resources with the grid, utilities often need to upgrade their distribution systems and equipment, and high levels of DER can have upstream effects requiring work on the transmission system.

Distribution infrastructure upgrades are also needed to address electric vehicle charging and widespread building electrification. Finally, ensuring distribution system resilience as climate conditions evolve will be increasingly important over the next decades.

2.5 Current Status of the Electric Transmission System

This section describes the State's electric transmission system in detail, including the operation and control of the system, the State's permitting processes for new and existing transmission infrastructure, and existing reliability and capacity constraints.

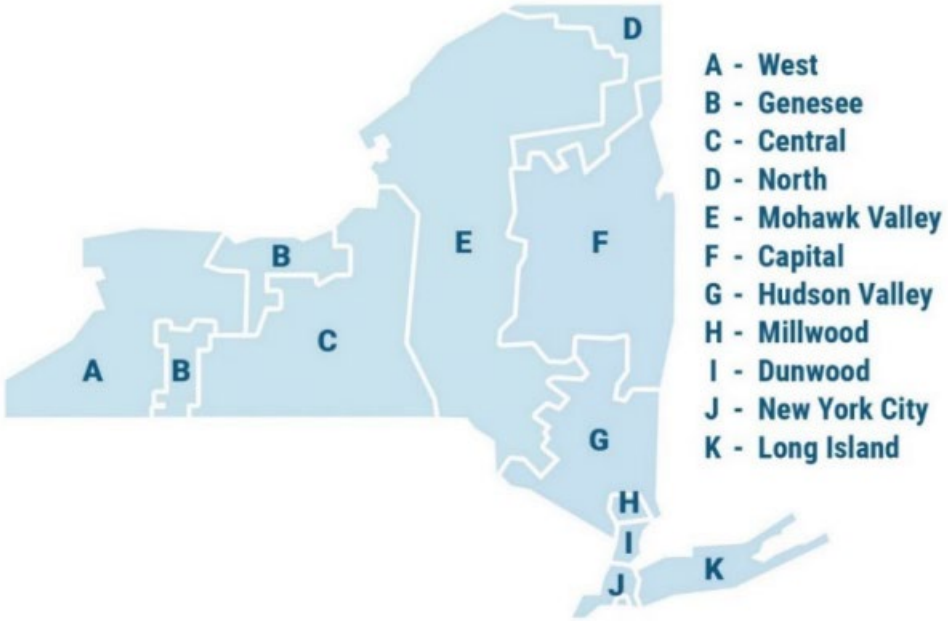
[59] Industrial Economics, Inc. 2023. The Benefits, Costs, and Economic Impacts of Undergrounding New York's Electric Grid. Accessed on November 25, 2024 at: https://dps.ny.gov/system/files/documents/2023/09/final-report-ny-undergrounding-2023-06-27.pdf. Page 14.

[60] New York Department of Public Service. 2021. Initial Report on the New York Power Grid Study. Accessed on November 25, 2024 at: www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/NY-Power-Grid/full-report-NY-power-grid.pdf. Page 16.

2.5.1 Existing Transmission System

The NYISO transmission system transfers power throughout the State and plays an important role in delivering generation from upstate and western New York to load centers in southern New York. NYISO manages the State's grid across 12 load zones (Zones). As **Figure 2-10** below shows, most of the demand is located downstate in Zones G through K, while most of the renewable energy potential is located upstate in Zones A through F, and offshore in Federal waters south of Zones J & K.

Figure 2-10. NYISO Load Zones[61]

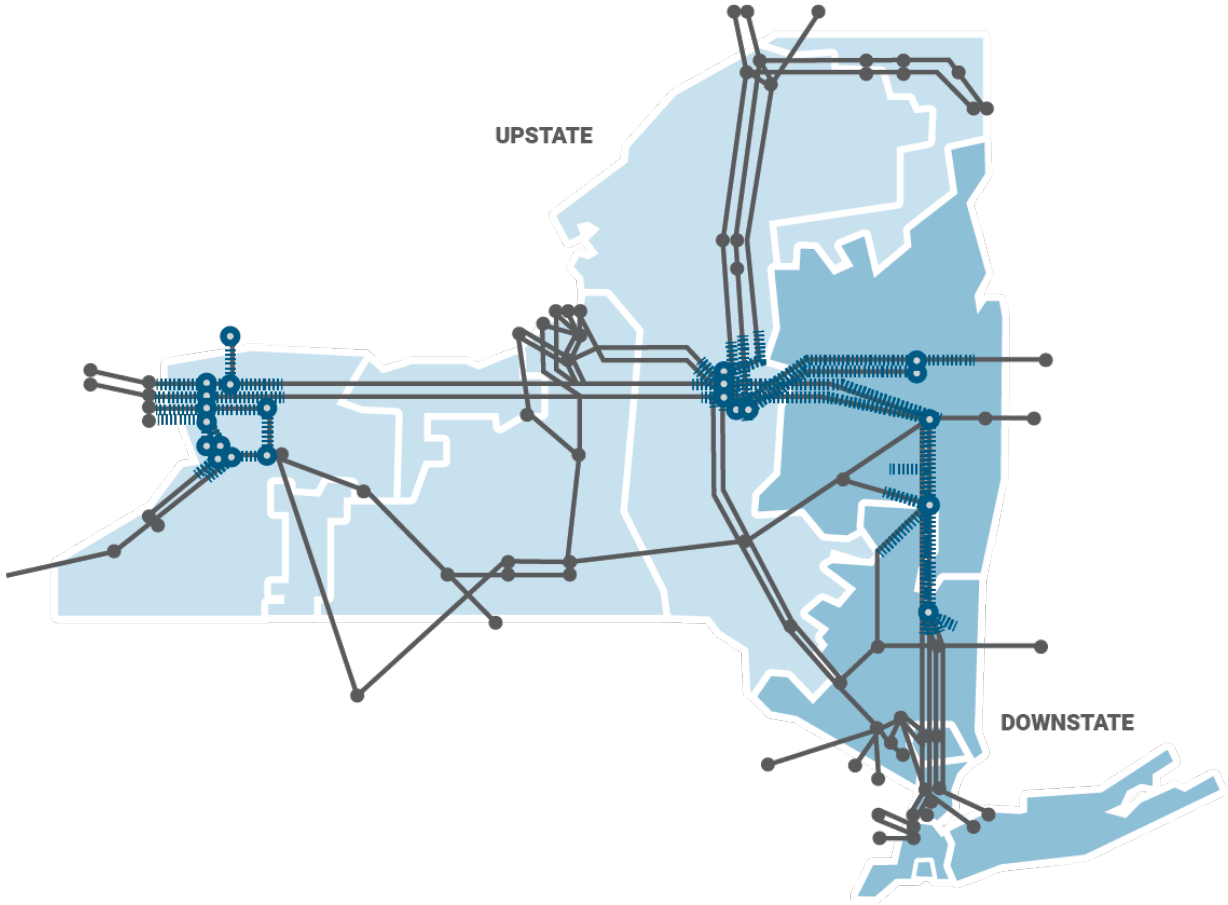


The network is also interconnected to the neighboring ISO-NE, PJM, Ontario, and Quebec transmission systems. NYISO is a net importer, utilizing transmission connections to purchase power from its neighbors to meet demand. The IOUs, NYPA, LIPA, and NY Transco own the majority of 11,264-mile NYISO transmission system.[62] **Figure 2-11** displays the NYISO transmission system.

[61] NYISO. 2022. 2022 Reliability Needs Assessment (RNA). Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2248793/2022-RNA-Report.pdf. Page 16.

[62] NYISO. 2024. 2024 Load & Capacity Data. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2226333/2024-Gold-Book-Public.pdf. Page 146.

Figure 2-11. NYISO Transmission System[63]



High voltage power lines are used to efficiently transfer power through the transmission system from generation sites to load centers, utilizing either high voltage direct current lines (HVDC) or high voltage alternating current lines (HVAC). HVDC lines lose less energy during transport and are therefore ideal for transmitting power over long distances. HVDC lines require fewer electricity conductors, enabling HVDC support towers to be smaller and requiring more narrow rights-of-way. As a result, HVDC lines tend to have less of an impact on the environment than HVAC lines.

HVDC lines are more expensive to construct because they require a converter station to adapt alternating current (AC) power from the generating source or local grid to direct current (DC) power; another converter station returns the power back to AC once the power line interconnects with the local AC grid. HVAC lines do not need converter stations since the electricity sourced and delivered is AC. However, fewer line losses on HVDC cables allow HVDC transmission lines to operate at higher voltages than HVAC lines and thus transmit power using fewer cables.[64] Fewer cables ultimately reduce construction costs and right-of-way (ROW) requirements. HVDC lines are estimated to become more cost effective when the transport distances extend from 370 to 500

[63] NYISO. 2020. Milestones Reached in Western NY Transmission Expansion that Supports Clean Energy in New York. Accessed November 25, 2024 at: https://www.nyiso.com/-/milestone-reached-in-western-ny-transmission-expansion-that-supports-clean-energy-in-new-york.

[64] For example, 1,200 MW can either be transported using one 320 kV HVDC cable or multiple 230 kV HVAC cables, each with a capacity of 300 to 400 MW.

overhead miles.[65] For submarine cable installation, which is more expensive than overhead construction, the breakeven point (when HVDC becomes more cost effective than HVAC) is about 30 miles.[66]

Transmission line voltages in New York range from 115 kV to 765 kV. Sub-transmission lines that connect to regional distribution substations operate below 115 kV. The greater the voltage, the less energy is lost during transmission. Voltage levels are also correlated with the distance that electricity is transported, with higher voltages utilized to transmit power longer distances. HVDC lines typically carry voltages above 100 kV. The most common transmission voltages in the NYCA are 115 kV and 345 kV, as depicted in **Table 2-1** below.

Table 2-1. Mileage of NYISO Transmission Facilities by Voltage[67]

	115 kV	138 kV	150 kV	230 kV	345 kV	500 kV	765 kV
Underground	78	415	24	20	241	66	0
Overhead	6,044	364	0	935	2,918	5	155
Total	6,122	779	24	955	3,159	71	155

HVDC and HVAC can be constructed overhead, underground, underwater, or through a combination of methods. About 90 percent of transmission lines in the state are overhead, and 10 percent are underground (a third of which are in New York City).[68] Overhead lines are typically cheaper to build (see **Table 2-2** below), and easier to maintain and upgrade, than underground lines.[69] The primary benefits of underground lines are reduced threats of damage, increased reliability, reduced maintenance, and reduced aesthetic impacts. The following sections describe the existing technologies used in overhead, underground, and submarine transmission construction.

Table 2-2. Transmission Infrastructure Costs[70]

Line Type	Minimum Cost per Mile – New Construction	Maximum Cost per Mile – New Construction	Minimum O&M Cost per Mile	Maximum O&M Cost per Mile
Overhead Transmission	$1,300,000	$11,000,000	$4,000	$37,000
Underground Transmission	$7,200,000	$32,000,000	$4,000	$100,000

[65] NYPSC. Case 19-T-0549. Exhibit 3. August 20, 2019. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=19-t-0549&CaseSearch=Search..

[66] Czernorucki, M., M. Salles, E. Costa, A. Melo, and L. Piegari. 2022. Comprehensive Overview on HVDC Converter Transformer Design: Additional Discussions to the IEC/IEEE 60076-57-129 Standard. IEEE Access 10:40165-40180. Accessed on November 25, 2024 at: https://doi.org/10.1109/ACCESS.2022.3165553.

[67] NYISO. 2024. 2024 Load & Capacity Data. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2226333/2024-Gold-Book-Public.pdf. Page 146.

[68] Industrial Economics, Inc. 2023. The Benefits, Costs, and Economic Impacts of Undergrounding New York's Electric Grid. Accessed on November 25, 2024 at: https://dps.ny.gov/system/files/documents/2023/09/final-report-ny-undergrounding-2023-06-27.pdf. Page 14.

[69] Avangrid. Comparison of Overhead and Underground Power Lines. Accessed on November 25, 2024 at: https://www.uirailroadtlineupgrades.com/assets/document-library/2021-3636%20UndergroundOverhead_Brochure%20_web.pdf.

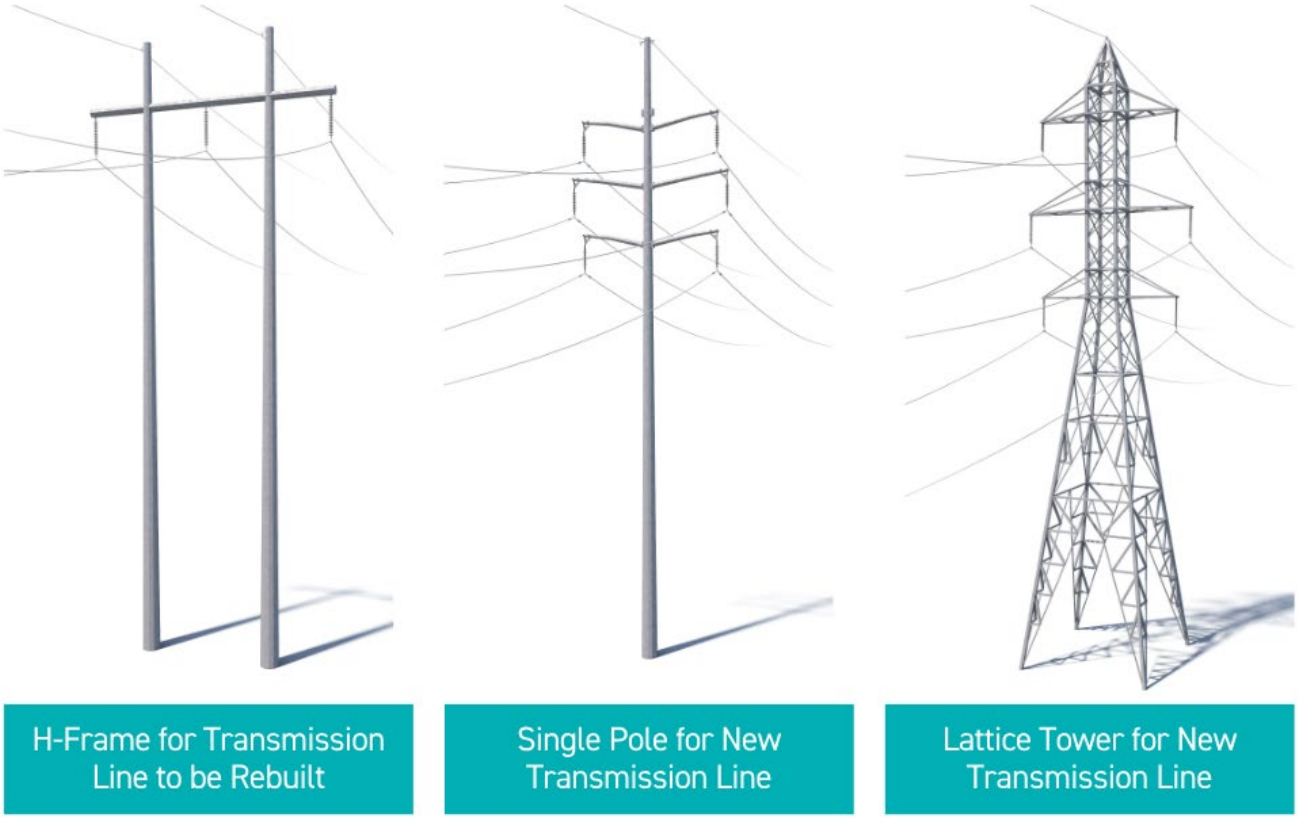
[70] Industrial Economics, Inc. 2023. The Benefits, Costs, and Economic Impacts of Undergrounding New York's Electric Grid. Accessed on November 25, 2024 at: https://dps.ny.gov/system/files/documents/2023/09/final-report-ny-undergrounding-2023-06-27.pdf. Page 14.

2.5.1.1 Overhead Transmission

Overhead transmission lines are the most common form of transmission in New York, especially in rural and suburban areas, and can range from low, sub-transmission, voltages to the highest voltages technically possible. Overhead cables are suspended on towers located within a ROW that is cleared of trees and other obstructions that could come into contact with transmission lines. Higher voltage cables require wider ROWs and/or utilization of taller transmission towers to avoid contact with trees and other obstructions.

Several types of structures can support transmission cables, including lattice, H-frame, monopole, guyed angle, and dead-end structures (see **Figure 2-12**). Lattice towers are complex structures that create a bigger disturbance than other structures and are commonly used to transport the highest voltage cables. H-frames require more horizontal space but are installed more quickly than lattice structures. Monopoles take up less space and are faster to install than both H-frame and lattice towers. Guyed angle and dead-end towers are typically used at the end of transmission lines since they are much smaller structures but require more wires, increasing failure risks. Regardless of the type of structure, vegetation in the ROW must be cleared to avoid hazards. **Table 2-3** below provides the typical overhead configurations.

Figure 2-12. Types of Overhead Transmission Structures[71]



[71] AEP Transmission. Mount Heron - Coal Creek Transmission Line Rebuild Project. Accessed on November 25, 2024 at: https://www.aeptransmission.com/Virginia/MountHeron/.

Table 2-3. Typical Overhead Transmission Right-of-Way and Structure Height Requirements[72]

Voltage	69 kV	115 kV	230 kV	345 kV	500 kV
Right-of-way (feet)	70-100	70-100	100-160	140-160	160-200
Structure height (feet)	50-70	55-80	60-90	115-150	90-150

An example of recently installed overhead transmission in New York is the Central East Energy Connect. The Central East Energy Connect project is a series of overhead HVAC transmission upgrades that traverses a hundred miles across the middle of the state. The project replaced 230 kV cables with 345 kV cables and upgraded substations to allow for greater capacity. The transmission developers assessed HVAC to be most cost effective since the individual line segments are relatively short, and the cost of the converter stations would outweigh the savings from utilization of an HVDC line.[73] The project upgraded the capacity of existing transmission lines and therefore needed no additional ROWs. The developer replaced existing H-frame towers with monopoles to reduce the space needed for the transmission line and to reduce costs. The developer also considered underground as an alternative solution but rejected the approach due to the environmental impacts and projected cost.[74]

2.5.1.2 Underground transmission

Undergrounding transmission lines is an alternative construction technique to overhead development that is typically used in urban areas where ROWs are unavailable or more costly. Transmission cables can be installed underground via direct burial or installation in duct banks.

Direct burial requires excavating a trench and installing the cable directly in the trench with filler material. Direct burial can be cheaper than installing cables in duct banks, but the practice is less common because the cables are more exposed to degradation or damage, and repairs are difficult.

Installing transmission lines in duct banks requires clearance of the ROW, digging a trench, installing duct bank and vaults for cable splicing, installing cables, and restoring the area. Construction ROWs typically require 12 to 15 feet of space to be cleared for a trench that is at least 6 to 8 feet deep.[75] The trench depth varies to account for obstacles including utility pipes, natural features, and roadway depths. Vaults, which grant access to the undergrounded cables, are constructed at regular intervals to allow for maintenance and repair. Vaults are typically 10 x 30 x 10 (length x width x height) spaces and enable permanent access to the cables.[76]

Figure 2-13 depicts an example of underground installation work in a city street.

[72] Great River Energy. Power poles. Accessed on November 25, 2024 at: https://greatriverenergy.com/transmission-and-delivery/power-line-project-faqs/power-poles/#:~:text=230%20kv%20transmission%20nominal%20voltage,typical%20right%20of%20way%20width.

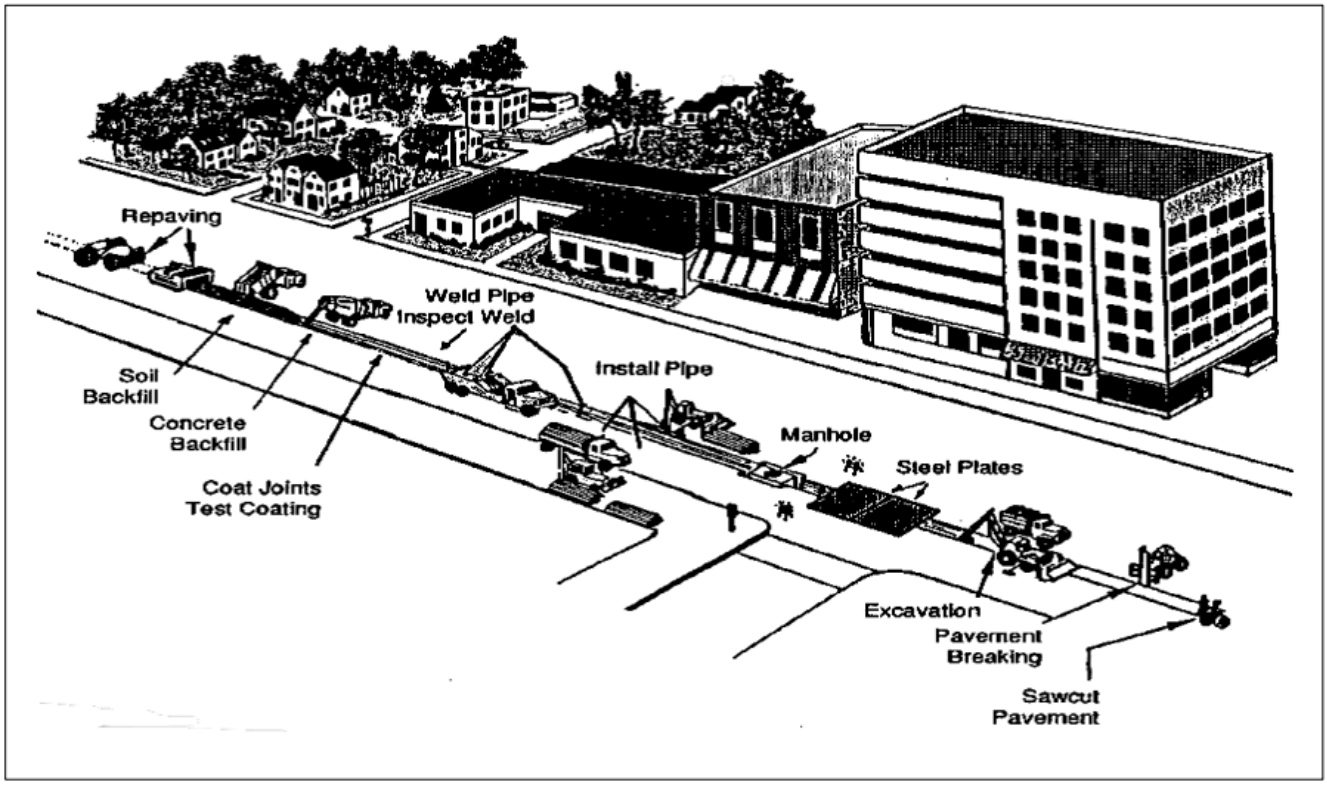
[73] NYPSC. Case 19-T-0549. Exhibit 3. August 20, 2019. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=19-t-0549&CaseSearch=Search

[74] *Ibid*, at 3-25.

[75] Public Service Commission of Wisconsin. 2011. Underground Electric Transmission Lines. Accessed on November 25, 2024 at: https://psc.wi.gov/Documents/Brochures/Under%20Ground%20Transmission.pdf.

[76] *Ibid*.

Figure 2-13. Underground Installation Work[77]



Horizontal directional drilling (HDD) is an alternative installation technique to trenching that involves boring a hole and fitting the transmission line, contained in a pipe, into the hole. This trenchless technique reduces the environmental impacts, and it is used to avoid existing structures, such as highways or railroads, at locations where submarine cables come ashore, and to minimize impact to sensitive environmental habitats such as streams, rivers and wetlands. However, due to the long installation process and expense, HDD is most frequently used over short distances to avoid existing infrastructure, such as roads. HDD projects typically span 500 to 3,500 feet in length. Microtunneling and jack and bore are other similar trenchless construction techniques used for undergrounding transmission lines.

Underground transmission lines are typically contained within pipes that are filled with a fluid, gas, or solid material that insulates the cable and regulates temperature. Types of underground cables include:[78]

- High-pressure, fluid-filled pipe (HPFF) - Three copper conductors are insulated with oiled paper, a metal shield, and synthetic oil pressurized at 200 pounds per square inch.
- High pressure, gas-filled pipe (HPGF) - Similar to HPFF installations pressurized with nitrogen gas instead of synthetic oil.
- Self-contained fluid filled (SCFF) - Conductors are hollow and filled with pressurized fluid reducing the risk of failure but significantly increasing construction costs. SCFF is typically used for underwater transmission construction.

[77] *Ibid.*

[78] *Ibid.*

- Solid cable, cross-linked polyethylene (XLPE) - The conductor is surrounded by solid polyethylene, a metallic sheath, and a plastic jacket. This method is the national standard for undergrounded transmission lines under 200kV.

Once construction is completed, sites are restored to their original condition, except for trees and other vegetation, which must be kept clear of trench sites. Underground transmission lines have a 50-year expected lifespan, shorter than overhead transmission lines' 80-year expected lifespan.

The Propel NY Energy Project is an example of an underground transmission project. It is an 89.7-mile underground HVAC transmission project to enable interconnection of 3,000 MW of transmission on Long Island. The project applied for a Certificate of Environmental Compatibility and Public Need in July 2024.[79] The majority of the project will transmit power at 345 kV, except for an 11.2-mile 138 kV segment.[80] The project will use XLPE cables and primarily rely on trenching construction techniques. HDD, microtunneling, and jack and bore will also be used where the project intersects bodies of water, wetlands, and other sensitive areas.[81] A short segment of the Propel transmission line will be submarine and constructed using techniques described in the section below.

2.5.1.3 Submarine Transmission

Submarine transmission is a type of undergrounding used to traverse bodies of water. Submarine transmission cables range from 70 millimeters (mm) to 210 mm in diameter and can carry either DC or AC up to 525 kV. The cables are buried under the seabed to avoid damage from anchors and commercial fishing equipment. To install submarine cables, a vessel typically pulls a jet plow with two skids through shallow water that slides on the floor of the water body to create a trench. The transmission cable is fitted into the trench by the jet plow and buried as disturbed sediment settles into the trench. Jet plows are designed to limit disturbance to the environment and can install cables much more quickly than other methods. Jet plowing was used in the Neptune project, a 25-mile transmission line connecting New Jersey and Long Island.

While jet plows are the most efficient technique for installing long marine cables, they cannot clear obstructions, such as large rocks and human-made debris. Such obstruction delays the installation process until the impediment can be cleared. Jet plowing results in the suspension of sediment that is elevated by the jets. The displaced sediment temporarily blocks sunlight, displaces the habitat of organisms living on the sea floor, can contaminate the water, and alters marine animal movement. Other submarine trench techniques include plowing and cutting, both of which are more forceful methods of creating a trench than jetting. These techniques are typically less efficient but can cut through obstacles on the sea floor that jetting cannot.

The HDD technique can be used to construct submarine transmission close to shore. Repairing faults in HDD cable installations is more complicated than in jet plow installations. While jet plow technology enables several pieces of line to be cut and repaired, the entire HDD line must be replaced if a fault occurs. Like jet plowing, submarine HDD can displace sediment that impacts the marine ecosystem.

Burying transmission lines is not always feasible and other measures are needed to protect submarine cables, such as covering cables with concrete cable protection devices or rock bags.

The Empire Offshore Wind project, two offshore wind farms (Empire Wind 1 and 2), under development south of Long Island, will deliver power through submarine transmission cables. The wind turbines will connect to

[79] NYPSC. Case 24-T-0446. Exhibit E-3, July 31, 2024. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={107A0991-0000-C5FA-A4FB-AE730BD84159}.

[80] *Ibid*.

[81] *Ibid.*, at E-3-12.

offshore substations, which will export power to shore using 230 kV (Empire Wind 1) and 345 kV (Empire Wind 2) HVAC and XLPE cables.[82] The project will lay cables through a combination of jetting, plowing, and trenching at sea and will use HDDs at cable landings.

2.5.2 Operation and Control

NYISO operates the transmission system in accordance with its FERC tariffs. The IOUs, LIPA, and independent transmission developers own the transmission assets that are subject to NYISO operational control. The IOUs and LIPA also own and operate their distribution systems.

2.5.3 Transmission Planning Process

This section describes the transmission planning and development mechanisms in the State. Historically, vertically integrated utilities planned and developed the transmission system based on reliability, economic growth, and service needs. The utilities continue to plan for and invest in their local systems to meet these objectives.

Deregulation transferred some responsibility for transmission planning to central system operators like NYISO. During its first decade of operation, NYISO expanded its planning and forecasting activities by establishing a Comprehensive Reliability Planning Process, producing an initial Reliability Needs Assessment, and participating in a Congestion Analysis and Resource Integration Study.[83] These NYISO-managed assessments are ongoing and continue to provide important information to planners and the Commission.

Recently, given the need for proactive system-wide planning for generation, distribution, and transmission to achieve public policy objectives (namely the CLCPA), New York has pursued development through mechanisms beyond the traditional utility district planning paradigm. These planning processes are recent additions to transmission planning and include the Coordinated Grid Planning Process (CGPP), the Public Policy Transmission Need (PPTN) process, and Tier 4 RECs.

- **CGPP:** AREGCBA, which followed the CLCPA, and the related 2020 PSC order (May Order) directed utilities to develop plans for upgrades needed at all levels of the transmission system.[84] The utilities proposed, and the Commission approved, the CGPP as the State's long-term planning process.
- **PPTN:** Under its FERC tariff, the NYISO refers potential bulk system needs driven by public policy requirements to the Commission every two years. Where the Commission finds there is such a need, the NYISO initiates a competitive process that invites developers to submit proposals for transmission solutions.
- **Tier 4 RECs:** The PSC approved the Tier 4 program in 2020 support transmission of renewable energy to New York City. Administered by NYSERDA, Tier 4 RECs support the competitive development of transmission projects to enable delivery of renewable energy into New York.

This section describes the above mechanisms in detail and then introduces the planned modifications to the State's transmission siting program.

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[82] Bureau of Ocean Energy Management. 2023. Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2) Construction and Operations Plan. Accessed November 25, 2024 at: https://www.boem.gov/sites/default/files/documents/renewable-energy/Public_EOW_COP_v7_Volume%201_Project%20Information%20Redacted.pdf

[83] Tierney, Susan. 2010. The New York Independent System Operator: A Ten-Year Review. Accessed on November 25, 2024 at: https://www.analysisgroup.com/globalassets/content/insights/publishing/tierney_nyiso_10_year_review.pdf. Page 18.

[84] *Order on Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act*, NYPSC Case No. 20-E-0197 (May 14, 2020).

2.5.3.1 Local Transmission Projects

Local transmission projects operate at less than 200 kV, are proposed by utilities, and funding is approved by the PSC through rate orders. Historically, these assets have been built and maintained by the utilities with reliability and service needs as primary concerns. The State's climate policies have required changes in the traditional approach to local transmission infrastructure.

The May Order directed the utilities to study their systems and identify upgrades needed to support CLCPA targets.[85] The utilities and LIPA completed the study (the Utility Study) in 2020 that divided local transmission and distribution projects into "Phase 1" and "Phase 2" projects. The Utility Study defined Phase 1 projects as "immediately actionable projects that satisfy Reliability, Safety, and Compliance purposes but that can also address bottlenecks or constraints that limit renewable energy delivery within a utility's system."[86] Phase 1 projects were already under construction or in utility capital investment pipelines. The Utility Study defined Phase 2 projects as local transmission and distribution capacity upgrades that enable the interconnection of new renewable generation.[87] Phase 2 projects are primarily driven by CLCPA targets.

The Utility Study identified 52 Phase 1 transmission projects that are estimated to provide 6,600 MW of capacity at a cost of $4.16 billion.[88] The PSC approved the Phase 1 projects in February 2021,[89] and the upgrades are expected to be completed in 2024. The DPS and NYSERDA Power Grid Study suggests that the Phase 1 projects may not provide enough capacity to prevent curtailments and may be insufficient for New York to achieve 2030 CLCPA goals. Phase 2 projects would help expand renewable integration headroom.[90]

The EDCs identified 62 Phase 2 projects, 42 of which were transmission projects, to increase headroom capacity.[91] The commission approved the projects to provide 3,429 MW of capacity at a cost of $4.28 billion by 2030.[92] The PSC-approved projects that address the near-term CLCPA targets benefit clean energy projects that have NYSERDA contracts, are located in regions with renewable generation projects, are under construction, are likely to be completed, or have completed siting applications.[93]

To address longer-term needs, the Commission directed the utilities to propose a CGPP framework. The new planning process is designed to ensure a comprehensive and coordinated view of system needs with a focus on facilitating the transition to clean energy sources and electrification of the economy. The process is organized in six phases that span a two-year period:[94]

1. Data collection and scenario analysis;
2. Network model development;
3. Local assessment of transmission and distribution;

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[85] *Ibid.*, at 6.

[86] NYPSC. Case 20-E-0197. Utility Transmission and Distribution Investment Working Group Report. November 2, 2020. Accessed on November 26, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2794FC7E-D2A6-4C79-8834-4B60FA25ED1F}. Page 2.

[87] *Ibid.*

[88] NYPSC. Case 20-E-0197. Utility Transmission and Distribution Investment Working Group Report. November 2, 2020. Accessed on November 26, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2794FC7E-D2A6-4C79-8834-4B60FA25ED1F}. Page 5.

[89] *Order on Phase 1 Local Transmission and Distribution Project Proposals*, NYPSC Case No. 20-E-0197 (February 11, 2021).

[90] New York Department of Public Service. 2021. Initial Report on the New York Power Grid Study. Accessed on November 25, 2024 at: www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/NY-Power-Grid/full-report-NY-power-grid.pdf. Pages 33-34.

[91] NYPSC. Case 20-E-0197. Utility Transmission and Distribution Investment Working Group Report. November 2, 2020. Accessed on November 26, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2794FC7E-D2A6-4C79-8834-4B60FA25ED1F}. Page 6.

[92] *Order Approving Phase 2 Areas of Concern Transmission Upgrades*, NYPSC Case No. 20-E-0197 (February 16, 2023). Page 33.

[93] *Ibid.*, at 23.

[94] *Order Approving a Coordinate Grid Planning Process*, NYPSC Case No. 20-E-0197 (August 17, 2023).

4. Review of preferred solutions;
5. Least-cost planning assessments; and
6. Development of CGPP report.

The report, containing proposals for transmission investment, is filed with the PSC for its review and decision on what upgrade projects to fund. Following the PSC order on the proposed projects, the next CGPP cycle begins.

The utilities initiated the first CGPP in January 2024, and the CGPP report is expected to be filed in January 2026. The results of the initial CGPP will include recommended upgrades. Approved projects will need to be permitted and constructed on time to meet the relevant State targets. The Commission has stated that it intends for the CGPP to continue on a repeating cycle and to continue to provide insight into transmission investment needs into the future.

2.5.3.2 Public Policy Transmission Need (PPTN) Process

The New York PPTN process is a proactive approach to transmission development that responds to public policy requirements. The PSC and the NYISO collaborate in the process.

NYISO initiates the PPTN process every two years by inviting stakeholders to submit transmission needs that they believe align with public policy requirements.[95] If the PSC determines that there is a PPTN, NYISO solicits proposals from transmission developers. Following a thorough evaluation of the competing proposals, the NYISO Board selects an eligible project based on cost effectiveness and other metrics.

Thus far, the NY PPTN process has selected four projects across the state, three of which have been completed:

- Empire State Line: A 20-mile, 345 kV transmission line from Niagara County to Erie County that transports 3,700 MW of renewable energy.[96] The project resolved the Western New York PPTN that sought greater utilization of Niagara hydro and Ontario imports and to relieve congestion.[97]
- Central East Energy Connect (Segment A): A series of upgrades to bring renewable power from upstate to downstate and reduce congestion. Referred to as "Segment A" of the AC Transmission Need, this project increases capacity across the Central East Interface by 1,000 MW.[98]
- New York Energy Solutions (Segment B): The second segment of AC Transmission PPTN upgrades that connects segment A to downstate load centers.[99]

The Propel Alternate Solution 5, which resolves the Long Island Offshore Wind PPTN by supporting 3,000 MW of offshore wind transmission, is under development.[100] On July 31, 2024, Transco and New York Power

[95] NYISO. 2017. Western New York Public Policy Transmission Planning Report. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/38387242/Western-New-York-Public-Policy-Transmission-Planning-Report.pdf/d3f62964-2e2d-588c-2da4-9aa33bb5470b?t=1687285471938. Page 8.

[96] NextEra Energy. Empire State Line: About the Project. Accessed on November 25, 2024 at: https://www.empirestateline.com/.

[97] NYISO. 2017. Western New York Public Policy Transmission Planning Report. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/38387242/Western-New-York-Public-Policy-Transmission-Planning-Report.pdf/d3f62964-2e2d-588c-2da4-9aa33bb5470b?t=1687285471938. Page ii.

[98] NYISO. 2024. How Historic Transmission Projects Bridged an Upstate-Downstate Clean Energy Divide. Accessed on November 25, 2024 at: https://www.nyiso.com/-/how-historic-transmission-projects-bridged-an-upstate-downstate-clean-energy-divide.

[99] *Id*.

[100] NYISO. 2024. 2023-2042 System & Resource Outlook. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf. Page 124.

Authority, joint parties developing Propel NY Energy, filed for a Certificate of Environmental Compatibility and Public Need.[101]

Overall, the PPTN process has successfully expanded transmission to enable the delivery of renewable resources to load centers downstate thus far and is expected to enable 3,000 MW of offshore wind via Long Island.[102] Additionally, NYISO forecasts that the Empire State Line will reduce carbon emissions by over seven million tons.[103]

The PSC has stated that it intends to continue using the PPTN process in the future to address bulk system needs driven by public policy requirements.

2.5.3.3 Tier 4 REC Procurements

Other transmission projects may be undertaken through State initiatives such as the Tier 4 program. The Tier 4 procurement process executed to date includes an open solicitation and an application review using the same criteria and weighting as generation-only procurements.[104] NYSERDA, the program administrator, issued the first Tier 4 solicitation in January 2021 and approved the first two contracts to Clean Path NY (CPNY) and Champlain Hudson Power Express (CHPE).[105]

CPNY is a 175-mile underground transmission line projected to deliver 7.9 million MWh of upstate wind and solar to New York City annually.[106] The PSC approved the CPNY project Tier 4 REC contract in April 2022. On November 27, 2024, NYSERDA announced a mutual agreement with CPNY to terminate the project's Tier 4 purchase and sale agreement.[107]

The CHPE project, a new 339-mile transmission line connecting 1,250 MW of hydro power from Canada to New York City, is presently under construction.

The Tier 4 projects, as well as the selected PPTN projects, are illustrated in **Figure 2-14.**

[101] NYPSC Case 24-T-0446. Application of New York Transco LLC and the New York Power Authority for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII. July 31, 2024.

[102] NYISO. 2023. Revisiting NYISO's Recent PPTN Successes. Accessed on November 25, 2024 at: https://www.nyiso.com/-/revisiting-nyisos-recent-pptn-successes.

[103] *Id*.

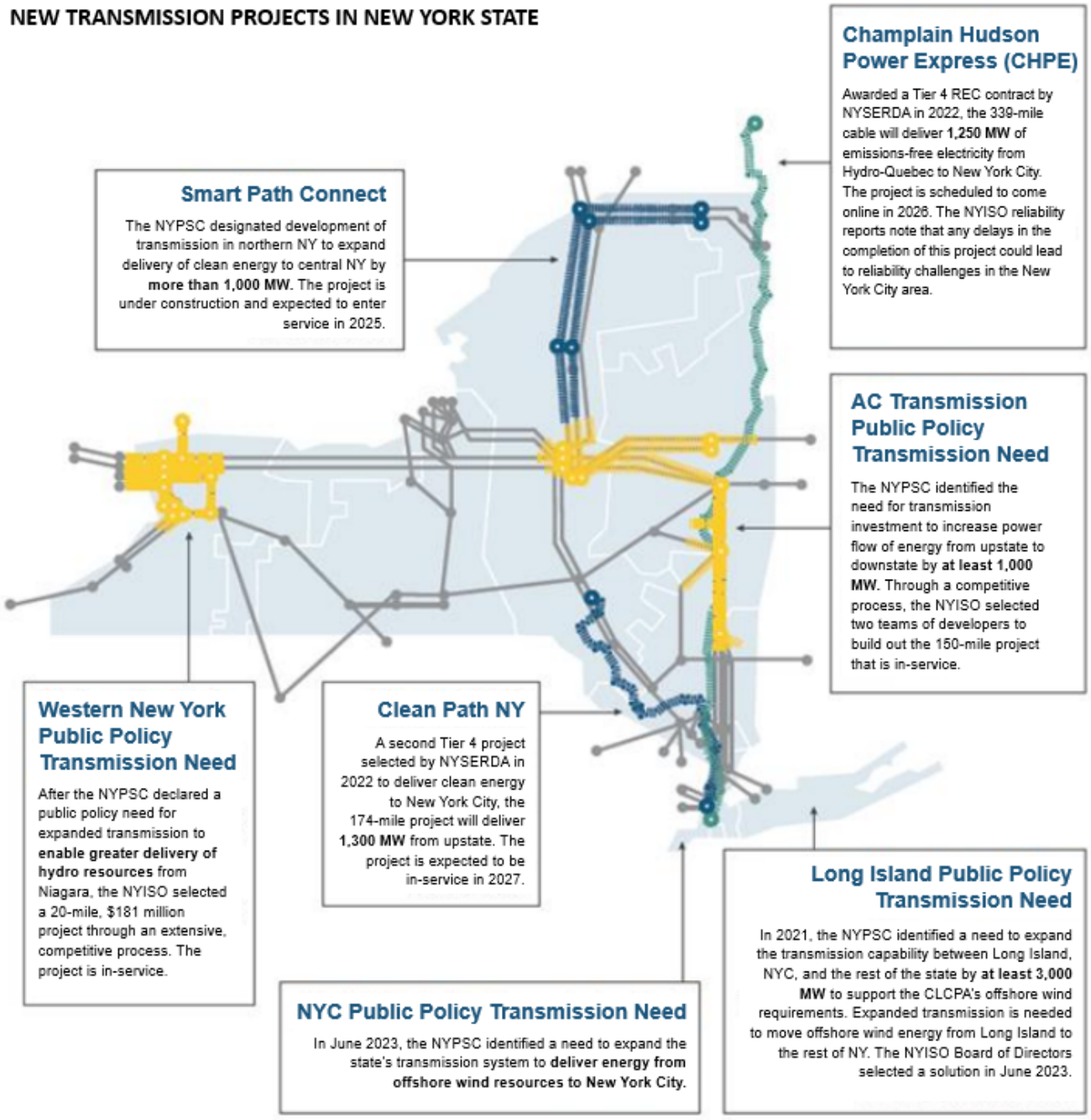
[104] *Order Adopting Modifications to the Clean Energy Standard*, NYPSC Case No. 15-E-0302 (October 15, 2020).

[105] NYSERDA. About Tier 4. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/All-Programs/Large-Scale-Renewables/Tier-Four/About-Tier-4.

[106] NYSERDA. 2023. New York State Tier 4 Renewable Energy Projects. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Fact-Sheets/LSR-tier4-fact-sheet-2023.pdf.

[107] NYSERDA. 2024. Tier 4 – New York City Renewable Energy. Accessed on December 2, 2024 at https://www.nyserda.ny.gov/All-Programs/Large-Scale-Renewables/Tier-Four.

Figure 2-14. Approved PPTN and Tier 4 RECs[108]



Changes to the type of generation, the location of new generation, and the forecasted demand growth indicate that the need for transmission upgrades and new transmission will only increase. Both the NYISO Resource Outlook and Power Grid Study recommend further transmission upgrades to meet CLCPA targets beyond 2030. The extended timelines from the initial Tier 4 and PPTN solicitations to the dates of project operation reflect the

[108] NYISO. 2024. 2023-2042 System & Resource Outlook. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf. Page 15.

challenges in developing, commercializing, permitting, and constructing transmission projects, and expediting these processes will be important as the NYCA generation mix continues to evolve.

2.5.3.4 Modifications to the Transmission Siting Program

New York Public Service Law article VII (Article VII), "Siting of Major Utility Transmission Facilities," requires a full review of the need for and environmental impact of the siting, design, construction, and operation of major transmission facilities in New York State.[109] Regulations for siting major transmission facilities are established through 16 NYCRR 85-2.1, "Procedures with Respect to All Electric Transmission Lines and Fuel Gas Transmission Lines 10 or More Miles Long." The RAPID Act preempted Article VII with respect to major electric transmission facilities and enacted Public Service Law article VIII (Article VIII) entitled "Siting of Renewable Energy and Electric Transmission."[110] The RAPID Act consolidates and aligns the ORES's renewable energy generation siting permitting process (under former section 94-c of the Executive Law) and the transmission siting permitting process into the newly created Article VIII regime. Section 2.7 details the current ORES generation siting permitting process and changes that will be made under Article VIII. Chapter 4 describes in detail the revisions to the transmission permitting process under the RAPID Act.

2.5.4 Transmission Capacity Constraints and Reliability

New or upgraded transmission may be needed to solve reliability deficiencies as the system evolves. These deficiencies are monitored by the NYISO for the bulk transmission system through a Reliability Needs Assessment (RNA) process. For example, the 2024 RNA forecasts the reliability of the bulk electric system from 2028 to 2034 across multiple scenarios that accounted for load growth and CLCPA targets and a projected shortfall in transmission system margins for New York City. The study concluded that that, while CHPE provides critical transmission reserves to New York City, the city still faces a long-term reserve shortfall. NYISO forecasts a 17 MW transmission security margin shortfall in 2033 and 97 MW shortfall in 2034 in its baseline model.[111] As depicted in **Figure 2-15** below, New York City faces a severe transmission margin shortfall of over 1,100 MW in a high demand scenario.[112]

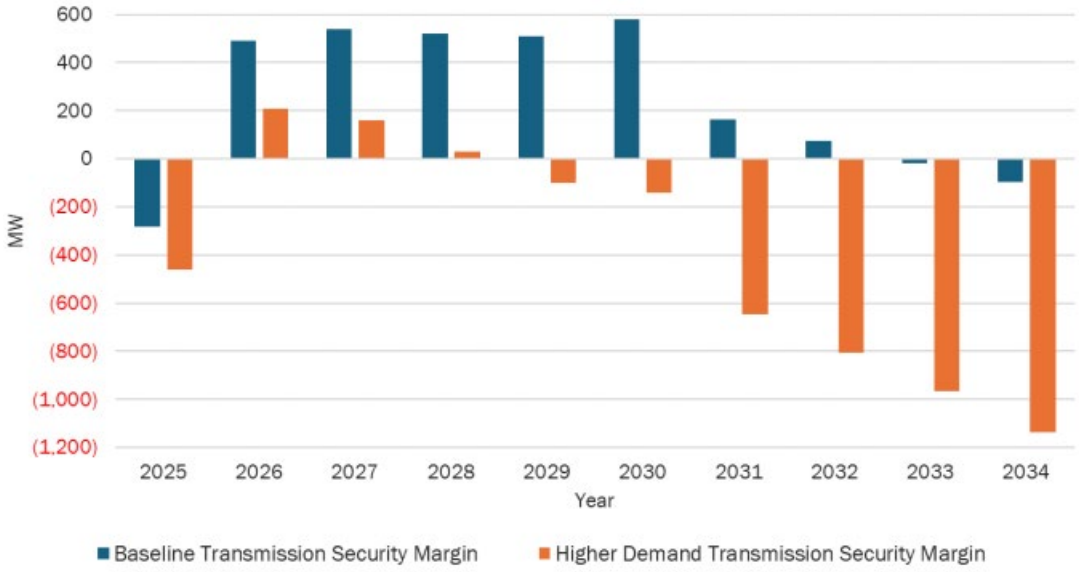
[109] New York Department of Public Service. Article VII Major Electric and Gas Transmission Facilities. Accessed on November 25, 2024 at: https://dps.ny.gov/article-vii-major-electric-and-gas-transmission-facilities.

[110] FY 2025 New York State Executive Budget 12673-01-4, Renewable Action Through Project Interconnection and Deployment ("RAPID") Act, 129-167.

[111] NYISO. 2024. Draft 2024 Reliability Needs Assessment. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/47773760/2024RNA_Report_103124MC.pdf/956d57b8-0a30-d1fb-70a1-9e1680ecdb6f. Page 50.

[112] *Ibid.*, at 51.

Figure 2-15. New York Transmission System Margins by Year (MW)[113]



Shrinking transmission margins pose long-term reliability concerns. New York State will continue to rely heavily on neighboring transmission systems and face new challenges as peak demand shifts to winter months.[114] Uncertainty regarding EV and building electrification adoption increases the risk that winter margins will be insufficient. Furthermore, fossil generation is expected to retire more quickly than new resources can interconnect in New York City.[115] Expanding transmission and rapidly replacing retiring generation with renewable energy and DERs will be critical to maintaining reliability.

2.6 Planned Modifications to the Electric Transmission System

The State's future electric system needs include basic infrastructure repairs to ensure reliability and relieve congestion, in addition to new investments to support the State's climate policies. While the precise nature and extent of transmission upgrades is presently unknown, achieving the above needs and accommodating load growth may require upgrades to most, if not all, of the existing transmission system. Near-term upgrade needs are reflected in utilities' five-year capital investment plans. Additionally, the State's electric system requires transmission enhancements and new transmission beyond upgrades identified in utility capital plans. System enhancements will serve two primary objectives: 1) connecting offshore wind directly to New York City and Long Island, and 2) upgrading upstate transmission to reduce congestion and the curtailment of renewables. The following sections summarize utility capital plans, describe offshore wind-related transmission needs, and highlight findings from the NYISO's Resource Outlook and the Power Grid Study's evaluation of congestion beyond 2030.

2.6.1 Utility Capital Forecasts

New York EDCs have begun upgrading the transmission system in response to the Phase 1 and Phase 2 upgrades identified in the Utility Study, leading to a significant increase in electric system investments. These

[113] *Ibid*.

[114] NYISO. 2022. 2022 Reliability Needs Assessment (RNA). Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2248793/2022-RNA-Report.pdf. Page 10.

[115] NYISO. 2023. 2023-2032 Comprehensive Reliability Plan. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/2248481/2023-2032-Comprehensive-Reliability-Plan.pdf. Page 49.

new investments, in addition to end-of-life asset replacements, reliability upgrades and other transmission modifications, have caused EDCs to increase their forecasted capital additions in each filing since the CLCPA.

2.6.1.1 National Grid

Transmission upgrades account for over 50 percent of National Grid's (also known as Niagara Mohawk Power Corporation) 2025-2029 Capital Investment Plan. The utility forecasted an average of $2.22 billion in distribution and transmission investments across fiscal years 2025 through 2029, a significant increase from previous years.[116] National Grid's previous 2023-2027 Capital Investment Plan projected investments totaling $792 million in 2023, $961 million in 2024, and an average of $1.06 billion across the five-year period.[117]

Transmission investments to facilitate achievement of CLCPA targets are significant factors in the 2025-2029 Capital Investment Plan. Multi-value transmission (MVT) upgrades, projects that address asset condition, reliability, safety, and compliance planning needs, total $1.56 billion across the plan period. MVT investments include Phase 1 local transmission projects identified in the Utility Study. Additionally, the Utility Study's Phase 2A projects total $1.81 billion across the plan period.

In addition to upgrades related to the State's climate policies, National Grid continues to invest in resilience, reliability, capacity additions, and the replacement of assets. Excluding CLCPA investments, National Grid forecasts $2.24 billion in transmission investments over the 2025-2029 period, a third of which are asset replacements due to age.

2.6.1.2 NYSEG and RG&E

Over the 2022-2026 capital forecast period, New York State Electric and Gas (NYSEG) projects that it will nearly triple its electric investments, while Rochester Gas and Electric Corporation (RG&E) forecasts that will double its electrical investments. Forecasted electric investments across both utilities rise from $1.09 billion in 2022 to $2.74 billion in 2026.[118]

CLCPA investments are a key factor in NYSEG cost increases: Utility Study Phase 1 investments account for $1.36 billion while Phase 2 projects account for $1.63 billion across the five-year period.[119] Phase 1 and 2 upgrades only account for $49 million in RG&E spending.[120] Transmission and distribution asset condition investments account for nearly a quarter of total investments across both utilities.[121] Transmission-specific asset condition cost drivers include replacements to transmission lines, substations, and transformers.

2.6.1.3 Central Hudson Gas & Electric

Central Hudson Gas & Electric's (Central Hudson's) 2024-2028 Capital Forecast projects modest increases in electrical system capital expenditures relative to its 2023-2027 Capital Forecast. Capital additions range from a low of $146 million in 2025 to a high of $171 million in 2028.[122] Investments needed to comply with FERC

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[116] NYPSC. Case 20-E-0380. National Grid Transmission and Distribution Capital Investment Plan. January 31, 2024. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={1036618D-0000-C131-8BE9-A770585182BC}. Page 8.

[117] NYPSC. Case 20-E-0380. National Grid. Transmission and Distribution Capital Investment Plan. February 1, 2022. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={BF63A9EE-C6FE-4AC4-AA06-2CEBC63AE4B9}. Page 5.

[118] Avangrid. 2022. NYSEG and RG&E Five-Year Capital Investment Plan (2022-2026). Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B138CC81A-A54E-4B8F-84E9-FB78D1506E02%7D. Page 28.

[119] *Ibid.*

[120] *Ibid.,* at 29.

[121] *Ibid.*, at 28-29.

[122] Central Hudson Gas & Electric Corporation. 2023. Central Hudson Gas & Electric 2024-2028 Corporate Capital Forecast. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={D09D0E89-0000-CE30-9837-FD98A9A6B214}. Accessed on November 25, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={D09D0E89-0000-CE30-9837-FD98A9A6B214}. Page 13.

mandates accounted for the majority of the increase.[123] While the utility did not segregate spending for Phase 1 and 2 upgrades, it estimated that 30 percent of electric project spending is designed to increase headroom in alignment with CLCPA goals and the Utility Study. Over the five-year period, Central Hudson expects to free 547 MW in capacity and begin upgrades for an additional 117 MW.[124]

2.6.1.4 ConEd

ConEd's capital spending and forecasts have rapidly increased in the last five years. In 2019, the utility invested $1.68 billion in its system, including $105 million on transmission and $256 million on substations.[125] By 2022, ConEd's annual spending had risen to $2.29 billion. ConEd's investments pertaining to the CLCPA and the Utility Study are uncertain based on the Capital Plans, though they likely account for forecasted increases in spending. **Table 2-4** below illustrates the increase in forecasted investments between actual 2019 spending, ConEd's 2020-2024 Capital Plan (submitted soon after passage of the CLCPA), and ConEd's 2023-2027 Capital Plan. The average annual expenditure forecasted for fiscal years 2023-2027 is double the actual 2019 expenditures.

Table 2-4. ConEd Actual and Forecasted Capital Investments

	2019 Actual	2020-2024 Capital Plan Annual Average[126]	2023-2027 Capital Plan Annual Average[127]
Transmission	$105 M	$175 M	$258 M
Substation	$256 M	$332 M	$1,001 M
Distribution	$888 M	$967 M	$1,184 M

2.6.1.5 Orange & Rockland (O&R)

In 2021, Orange and Rockland (O&R) submitted a multi-year rate plan for 2022 to 2024. Plant additions increased from $108 million in 2021 to $147 million in 2024, driven in part by transmission investments.[128] The most significant addition was a new Lovett 345 kV substation totaling $48 million during the plan period.[129] O&R testified that the project was a necessary system reinforcement that was identified in NYISO's Reliability Needs Assessment.[130] The multi-year rate plan investments also included distributed energy resource management system (DERMS) investments that O&R testifies are necessary for compliance with the CLCPA.

[123] For example: see Federal Energy Regulatory Commission. FERC Order No. 2222 Explainer: Facilitating Participation in Electricity Markets by Distributed Energy Resources[i]. Accessed on November 25, 2024 at: https://www.ferc.gov/ferc-order-no-2222-explainer-facilitating-participation-electricity-markets-distributed-energy.

[124] *Ibid.*, at 7-8.

[125] NYPSC. Case 19-E-0065. Consolidated Edison Company of New York, Inc. Report on 2019 Capital Expenditures and 2020-2024 Electric Capital Forecast." February 28, 2020. https://jointutilitiesofny.org/sites/default/files/%7B75871DAD-C310-4D32-BDDC-197D3CD44A60%7D.pdf. Page 1.

[126] *Ibid.*, at 90.

[127] NYPSC. Case 19-E-0065. Consolidated Edison Company of New York, Inc. Report on 2022 Capital Expenditures and 2023 - 2027 Electric Capital Forecast. February 28, 2023. https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={00719986-0000-C219-9D4A-39AE402B727B}. Page 95.

[128] NYSPC. Case 21-E-0074. Accounting Panel. March 31, 2021. Schedule 2. Accessed on November 26, 2024 at:: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={36EDB565-14CE-4E7C-8CBB-CD113DA1913E}

[129] *Ibid*.

[130] NYSPC. Case 21-E-0074. Electric Infrastructure and Operations Panel Rebuttal Testimony & Exhibits. June 18, 2021. Accessed on November 26, 2024 at: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={5CDB7A4A-747A-4E6A-BF3C-58B75F630758}. Pages 15-16.

2.6.2 Offshore Wind Transmission

2.6.2.1 Transmission Buildout

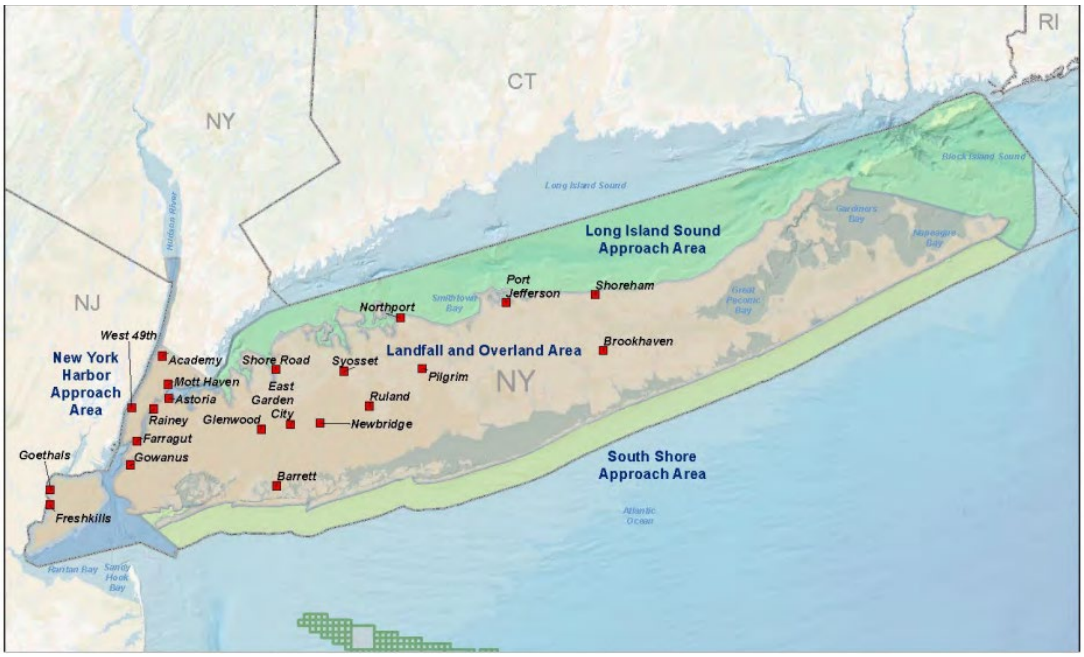
Offshore wind is integral to achieving CLCPA renewable generation targets and meeting forecasted load growth in New York City. While the CLCPA requires 9,000 MW of offshore wind capacity by 2035, more capacity will likely be needed (up to 20,000 MW)[131] to reach decarbonization goals. Offshore wind can connect to Long Island (Zone K) and travel to New York City via bulk transmission or connect directly to New York City (Zone J). The exact points of offshore wind interconnection will impact the nature and location of transmission upgrades.

Land-based transmission investment will also be necessary to transport power to New York City and other load zones to the north of the city (Zone I). NYISO's Offshore Wind Study indicates that on-land transmission tie-lines and bulk transmission upgrades are likely necessary to deliver offshore wind connecting through Long Island (Zone K).[132] Coordination between regulatory agencies, generation and transmission developers, utilities, and other stakeholders will be critical in assessing viable points of interconnection and constraints.

2.6.2.2 Cable Routing to Southern New York

NYSERDA commissioned a Cable Corridor Constraints Assessment to evaluate the social, environmental, economic, regulatory, and infrastructure impacts of various offshore wind transmission interconnections to Long Island and New York City. The study analyzed four approach areas: South Shore, Long Island Sound, New York Harbor, and Landfall and Overland Area. **Figure 2-16** illustrates the possible approach areas.

Figure 2-16. Cable Routing Study Approach Areas[133]



[131] The CLCPA Draft Scoping Plan included a 20 GW target by 2050.

[132] "New York Department of Public Service. 2021. Initial Report on the New York Power Grid Study. Accessed on November 25, 2024 at: www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/NY-Power-Grid/full-report-NY-power-grid.pdf. Page 73.

[133] NYSERDA. 2023. Offshore Wind Cable Corridor Constraints Assessment. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/2306-Offshore-Wind-Cable-Corridor-Constraints-Assessment--completeacc.pdf. Page 32.

Rather than identify a preferred pathway for interconnecting offshore wind, the analysis highlights the challenges that each approach area poses. In general, the assessment stresses the importance of innovation in routing, design, construction, maintenance, and operation of offshore cables to minimize negative impacts.[134] Specific constraints in each approach area include:

- **South Shore:** The primary constraint for the South Shore approach area is recreational and commercial fishing.[135] Transportation constraints, environmental justice (EJ) and disadvantaged communities, and recreation areas are the most significant overland concerns.[136]
- **Long Island Sound:** Environmental concerns pose the greatest constraints for the Long Island Sound approach area including geological challenges and sensitive habitats.[137] There are several other high-ranking constraints across the possible cable routes, such as recreational and commercial fishing, archeological and cultural sites, navigation areas, and other utility infrastructure.[138] Overland corridor constraints are generally less significant and mostly related to topographical challenges.[139]
- **New York Harbor:** The New York Harbor approach area has the most high-ranking constraints of the study areas. The limited waterbody dimensions, waterfront infrastructure, vessel traffic, and navigation in the area, which affect installation, are constraints in twelve of thirteen harbor approach areas.[140] Environmental constraints and existing utility infrastructure also pose issues throughout the area. EJ and disadvantaged communities are high-ranking concerns for overland cable routing.[141]

2.6.2.3 Offshore Wind PPTN

In June 2023, the PSC initiated a PPTN process for the interconnection of at least 4,770 MW and up to 8,000 MW of offshore wind to New York City with a targeted in-service date of January 1, 2033.[142] The PSC stated that onshore capacity upgrades at various points of interconnections will likely be necessary to accommodate the transmission of offshore wind.[143] Project solicitations opened in April 2023, and NIYSO forecasts that its board will review and issue a decision by Q3 of 2025.[144] The offshore wind PPTN, operating in parallel with the progressing Offshore Renewable Energy Certificates (OREC) program, provides an opportunity to expand the transmission system and to interconnect critical resources that will help New York achieve CLCPA targets.

2.6.3 Upstate Transmission

2.6.3.1 Renewable Congestion

As renewable capacity increases, the flow of electricity from upstate to load centers in and around New York City will increase, leading to transmission congestion. The NY Resource Outlook provides several recommendations to address transmission system challenges, including installing dynamic reactive power

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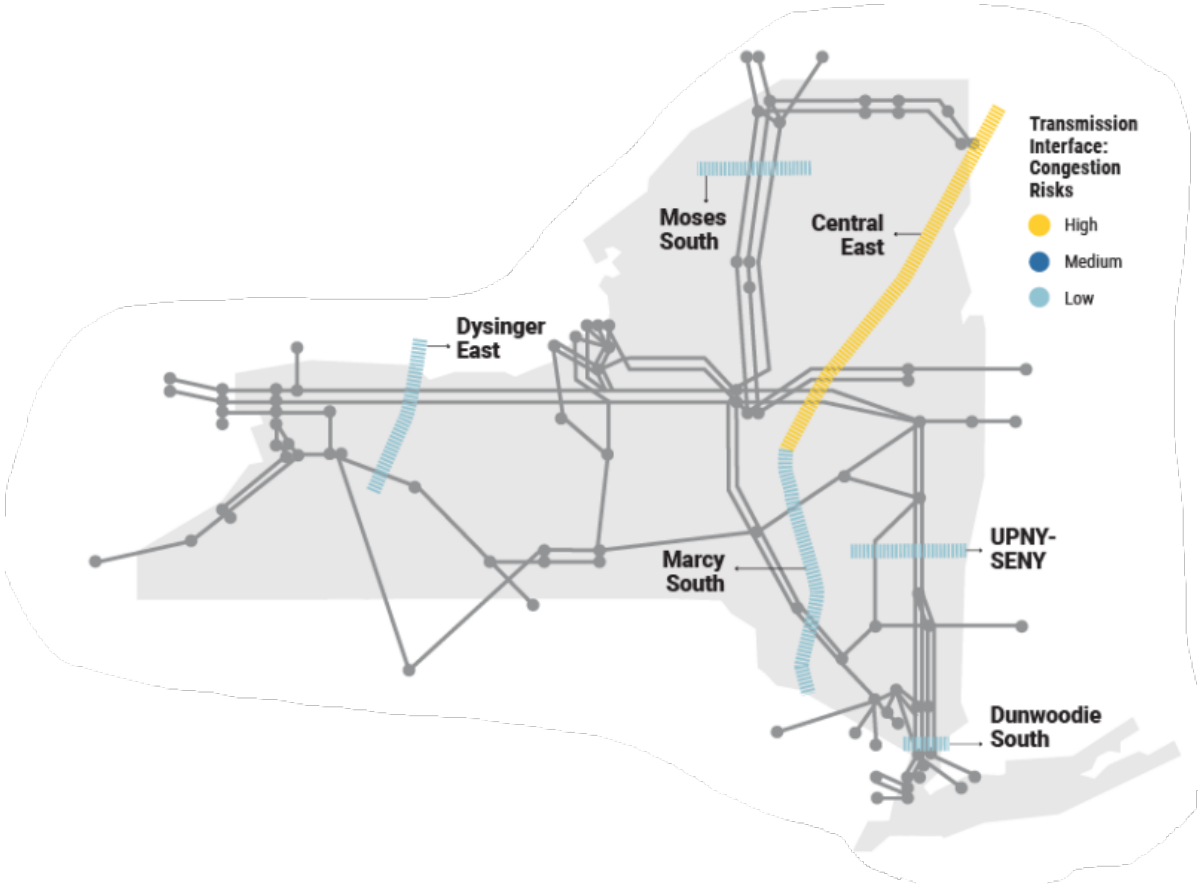
[134] *Ibid.*, at 262.
[135] *Ibid.*, at 54.
[136] *Ibid.*, at 57.
[137] *Ibid.*, at 55.
[138] *Ibid.*, at 55.
[139] *Ibid.*, at 58.
[140] *Ibid.*, at 55.
[141] *Ibid.*, at 59.
[142] *Order Addressing Public Policy Requirements for Transmission Planning Purposes*, NY PSC Case No. 22-E-0633 (June 22, 2023). Appendix A.
[143] *Ibid.,* at 37.
[144] Tawde, Surpriya. 2024. NYC PPTN Update. Accessed on November 25, 2025 at: https://www.nyiso.com/documents/20142/43675604/02a_NYCPPTN_ESPWG_2024_03_21.pdf/0f060e28-de20-f55b-1e68-5430f4cb3aaa.

support on the Central East Interface and monitoring bulk transmission expansion for the integration of new renewable generation in the Western, Southern, and Northern New York regions.

The primary concern beyond 2030 in the Central East Interface is the curtailment of renewables due to capacity additions and congestion.[145] NYISO expects that dynamic reactive power investments (to support the voltage performance of the grid) could reduce congestion and liberate 40 to 220 GWh of renewable energy by 2035.[146] Devices such as static synchronous compensators (STATCOMs) and grid-enhancing technologies (GETs) can regulate electric transmission at a fraction of the cost of traditional upgrades.[147] **Figure 2-17** depicts congestion risk at transmission interfaces after 2030.

Figure 2-17. Bulk Transmission Congestion Risk[148]



The NYISO Resource Outlook states that constraints in Western and Northern New York may be resolved by the EDCs' Phase 1 and 2 transmission upgrades.[149] However, the study found that increases in renewable

[145] NYISO. 2024. 2023-2042 System & Resource Outlook. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf. Page 60.

[146] *Ibid.*, at 15.

[147] U.S. Department of Energy. 2022. Grid-Enhancing Technologies: A Case Study on Ratepayer Impact. Accessed on November 25, 2024 at: https://www.energy.gov/sites/default/files/2022-04/Grid%20Enhancing%20Technologies%20-%20A%20Case%20Study%20on%20Ratepayer%20Impact%20-%20February%202022%20CLEAN%20as%20of%20032322.pdf.

[148] NYISO. 2024. 2023-2042 System & Resource Outlook. Accessed on November 25, 2024 at: https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf. Page 56.

[149] *Ibid.*, at 16.

development in those regions could limit several sections of the transmission system.[150] Bulk transmission upgrades may eventually be necessary to transport renewables to southern load centers, and monitoring the development of renewables will be critical to anticipate the timing of necessary investments.

Brattle, in its analysis of the Power Grid Study, which considered transmission needs through 2040, concludes that a high level of congestion into New York City is likely even when considering the additional transmission provided by the Tier 4 procurements (CPNY, CHPE).[151] The study also suggests that new bulk transmission lines may be needed to achieve 2040 CLCPA targets,[152] and that the significant congestion that would otherwise constrain flows into the southern load centers after 2030 may render transmission projects cost effective.[153]

Specifically, Brattle identified several transmission upgrades that would relieve 2040 congestion in an initial and a high growth scenario. The initial scenario upgrades, also shown in **Figure 2-18,** include:[154]

- Increasing Millwood South Interface transfer capability to 13,000 mega volt-amperes (MVA);
- Increasing Dunwoodie South Interface transfer capability to 6,000 MVA;
- Increasing Dunwoodie Shore Road cable LTE rating to approximately 3,000 MVA;
- Increasing Coopers Corner-Middletown-Rock Tavern-Dolson Ave 345 kV line section to approximately 3,000 MVA; and
- Increasing Ladentown-Ramapo 345 kV line LTE ratings to approximately 2,500 MVA.

The study results indicate that these upgrades would reduce 2040 congestion from 1.5 percent (no upgrades) to 0.1 percent in the initial scenario at a cost of $2.6 billion.[155] Supporting local transmission upgrades may also be needed but are not included in these estimates.

[150] *Ibid.*

[151] New York Department of Public Service. 2021. Initial Report on the New York Power Grid Study. Accessed on November 25, 2024 at: www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/NY-Power-Grid/full-report-NY-power-grid.pdf. Page 79.

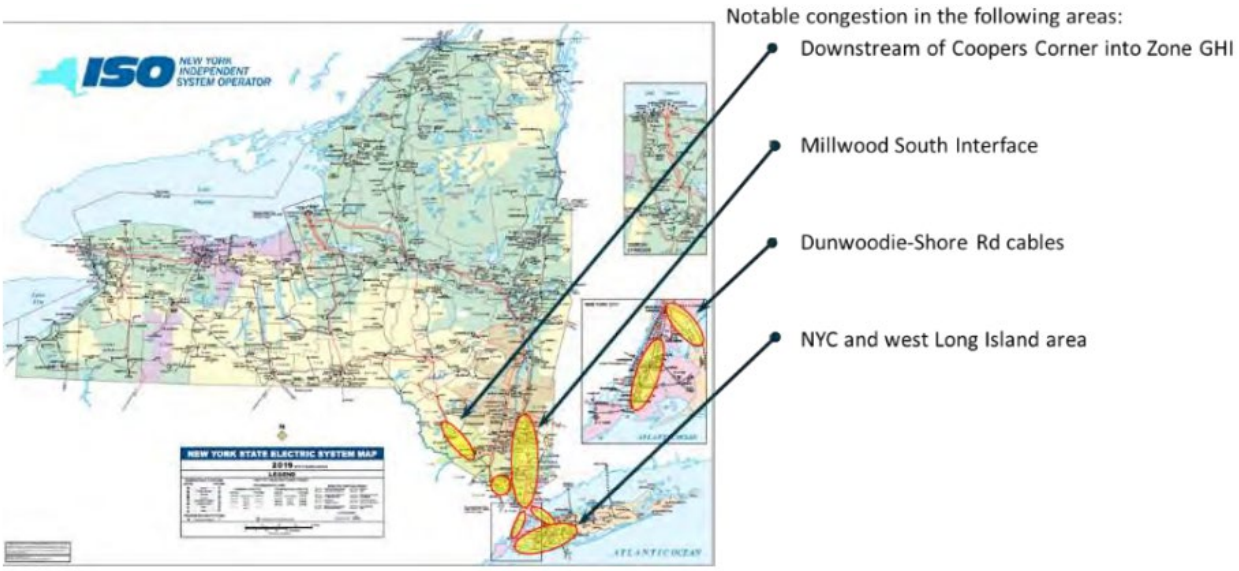
[152] *Ibid.*, at 86-87.

[153] *Ibid.*

[154] New York Department of Public Service. 2021. Initial Report on the New York Power Grid Study. Accessed on November 25, 2024 at: www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/NY-Power-Grid/full-report-NY-power-grid.pdf. Page E-49.

[155] *Ibid.*, at E-50.

Figure 2-18. Zero Emissions Study 2040 Projected Congestion Areas[156]



2.6.3.2 Local Renewable Energy Zones

Renewable Energy Zones (REZ) are areas of significant resource potential that lack transmission infrastructure. The Power Grid Study identified three REZ:[157]

- A zone in the Central Hudson Service Territory where a mesh transmission configuration could interconnect NYSEG facilities and new renewable generation.
- A zone in the Orange and Rockland Service Territory that could enable renewable development to connect to an existing 345 kV system.
- A zone in the AVANGRID/National Grid Service Territories that could expand a 115 kV loop to connect to a 345 kV system.

A REZ program would require the coordination of transmission and generation developers. Such a program is not without precedent, as the REZ approach has been used to enable development of renewable resources in Texas[158] and Australia.[159]

2.7 Major Renewable Energy Facility Permitting under Article VIII of the Public Service Law

Former Executive Law § 94-c (section 94-c) established an expedited permitting process for large-scale (25 MW or larger) renewable energy projects. Since its enactment in 2020, the permitting process established under section 94-c and its implementing regulations at former 19 NYCRR part 900 (Part 900) was the existing regime for renewable energy generation siting in New York. It replaced the Article 10 process of the New York Public

[156] *Ibid.*, at 81.

[157] *Ibid.*, at 40.

[158] Americans for a Clean Energy Grid. Texas as a National Model for Bringing Clean Energy to the Grid. Accessed on November 25, 2024 at: https://www.cleanenergygrid.org/texas-national-model-bringing-clean-energy-grid/.

[159] Australian Energy Market Operator. 2024. 2024 Integrated System Plan. Accessed on November 25, 2024 at: https://aemo.com.au/-/media/files/major-publications/isp/2024/2024-integrated-system-plan-isp.pdf?la=en.

Service Law and the State Environmental Quality Review Act for renewable energy generation projects, with the intent of accelerating the timeline for renewable generation permitting in the State.

Passage of the RAPID Act repealed Executive Law § 94-c and enacted Article VIII entitled, "Siting of Renewable Energy and Electric Transmission."[160] While Article VIII now governs the renewable energy generation siting process, it largely mirrors former section 94-c. All the existing functions, powers, obligations, and duties granted to ORES by former section 94-c remain with ORES after the transition from the Department of State to DPS, with the addition of new functions, powers, obligations, and duties related to major electric transmission siting as set forth in the RAPID Act.[161] Article VIII also replicates the expedited timeline and process under former section 94-c. In addition, the RAPID Act transferred former Part 900 to 16 NYCRR part 1100 (Part 1100) subject to conforming changes that were filed with the New York Secretary of State effective July 17, 2024. The following requirements and authorities under the former section 94-c are now applicable under the new Article VIII and Part 1100.[162]

- ORES has the authority to issue a single siting permit for the construction of major renewable energy facilities that applies at the State and local levels, but applicants will still be required to obtain any approvals necessary under federal law, including federally delegated permits.
    - In making a final siting permit determination, ORES is required to make a finding that the proposed project, together with any uniform standards and condition (USCs) and site-specific conditions, would comply with all applicable substantive State and local laws and regulations. ORES may elect not to apply a local law that is unreasonably burdensome in view of CLCPA targets and environmental benefits of the project.
- The applicant must conduct pre-application public engagement with municipalities and the local community. Proof of consultation with host municipalities and communities is required for a permit application to be deemed complete.
- ORES has 60 days from the date of its receipt of a permit application to make a completeness determination.
- Within the established comment period, the host municipalities must submit a statement indicating whether the proposed major renewable energy facility complies with applicable local laws.
- The final decision on a project's permit must be made by the ORES within one year of the application being deemed complete and within six months if the facility is located on brownfield, former commercial or industrial, landfill, former power plant, or abandoned or underutilized sites.
- Projects must be designed to avoid, minimize, and mitigate, to the maximum extent practicable, potentially significant adverse environmental impacts.
- Only "substantive and significant" issues raised by a municipality or members of the public require evidentiary hearings, testimony, and briefing.

In terms of modifications to the current permitting regime, Article VIII mandates additional requirements for farmland protection, and recent changes to the State's Freshwater Wetlands Act (Environmental Conservation Law article 24) will require that ORES's rules regulating freshwater wetlands be revisited.

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[160] FY 2025 New York State Executive Budget 12673-01-4, Renewable Action Through Project Interconnection and Deployment ("RAPID") Act, 129-167.

[161] NYSERDA. About ORES. Accessed on November 25, 2024 at: https://dps.ny.gov/about-ores#.

[162] Executive Law § 94-c Major renewable energy development program.

Article VIII requires major renewable energy facilities (and transmission facilities) to be designed, constructed, and operated in a manner that avoids, minimizes, or mitigates, to the maximum extent practicable, potential significant adverse impacts to land used in agricultural production, with additional consideration for land within an agricultural district or land that contains mineral soil group 1-4 (i.e., soil that may best support crops).

There are about seven million acres of farmland in New York, representing roughly 20 percent of the state's land area.[163] Agricultural lands are attractive for renewable developers given their topography, vegetation, and location.[164] Under the existing ORES permitting process of large-scale renewable energy projects, the permit application requires a study of agricultural impacts and mitigation measures, including impacts during construction, restoration work after construction, operation, and decommissioning. The typical agricultural plan also provides a classification of agricultural resources in the siting area with data and maps, a soil study, and details on drainage. The new design requirements, on top of the existing application requirements, will impact the process and considerations for renewable energy siting.

Under the RAPID Act, ORES is the sole State-level permitting authority that implements the State's Freshwater Wetlands Act (Environmental Conservation Law article 24) for major renewable energy facilities. Recent changes to the Act will necessitate changes to ORES's rules regulating freshwater wetlands, which cover about seven percent of the state.[165] The Act was amended in 2022 to make several important changes to the way the Act is administered, including a move away from the use of wetland maps to a system that uses applicable definitions and criteria to establish State regulatory jurisdiction.[166] The new system for making jurisdictional determinations goes into effect starting January 1, 2025.[167] Additionally, the size of wetlands subject to State regulation will decrease from 12.4 acres to 7.4 acres starting January 2028.[168] ORES's current regulations regulating State freshwater wetlands will need to be modified to implement the 2022 amendments to the Act.

[163] NYSERDA. 2023. Solar Installations on Agricultural Lands. Accessed on November 25, 2024 at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/NY-Sun/2023-Solar-Installations-in-Agricultural-Lands.pdf. Page 133.

[164] *Ibid*.

[165] New York Department of Environmental Conservation. Status And Trends Of Freshwater Wetlands In NYS. Accessed on November 25, 2024 at: https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program/status-trends-freshwater-wetlands#:~:text=New%20York%20has%20an%20estimated,Appalachian%20Highlands%20(%2D5%2C700%20acres).

[166] New York Department of Environmental Conservation. Freshwater Wetlands Program. Accessed on November 25, 2024 at: https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program.

[167] *Ibid*.

[168] *Ibid*.

CHAPTER 3 | Environmental Setting

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(ii) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter provides an overview of the areas to be affected by the proposed action, defined under 6 NYCRR 617.2(l) as "the physical conditions that will be affected by [the] proposed action, including land, air, water, minerals, flora, fauna, noise, resources of agricultural, archeological, historic or aesthetic significance, existing patterns of population concentration, distribution or growth, existing community or neighborhood character, and human health."

The environmental setting described in this chapter serves as a baseline of the existing environmental conditions against which **Chapter 5** through **Chapter 10** evaluate and compare the potential impacts of the promulgation of regulations implementing the RAPID Act. The areas potentially affected by the proposed action include the entire State of New York.

This chapter is organized into twelve sections consistent with the following environmental, demographic, and socioeconomic characteristics in the State:

- **Section 3.1** provides a brief description of the State's physiography, geology, and soil taxonomy;
- **Section 3.2** describes the different types of land uses across the State, including open and recreational space and existing land uses associated with the electric industry;
- **Section 3.3** describes the State's oceans and estuaries, wetlands, drinking water, groundwater, water use and flooding, and the connection between energy and water resources;
- **Section 3.4** summarizes climatic conditions such as temperature and precipitation, air quality, and climate change;
- **Section 3.5** describes the State's plants and animals, including forest resources;
- **Section 3.6** overviews the State's aesthetic and visual resources;
- **Section 3.7** discusses the importance of the State's cultural and historic resources;
- **Section 3.8** covers solid and hazardous waste generation and management practices;
- **Section 3.9** summarizes potentially relevant public health issues such as ozone, particulate matter, asthma, and noise;
- **Section 3.10** describes the population in the State and the factors that contribute to the development and maintenance of community character;
- **Section 3.11** describes the transportation modes and facilities found throughout the State; and
- **Section 3.12** provides an overview of the State's demographic and socioeconomic characteristics, including employment, income and wages, housing, municipal revenues, and a description of disadvantaged and minority populations that could be subject to disproportionate and adverse environmental impacts.

3.1 Physical Geography

New York State is the 27th largest state in the United States by size, covering more than 47,000 square miles (30.1 million acres),[169] including approximately 1,600 square miles (1.0 million acres) of inland water bodies.[170] The topography of the State is generally hilly or mountainous in all areas except Long Island and the relatively level areas adjacent to Lake Erie, Lake Ontario, and the St. Lawrence River. The highest topographic variations are found in the Catskill and Adirondack Mountains, where elevations reach higher than 4,000 feet and variations between peaks and valleys reach up to 2,500 feet. Approximately 40 percent of the State has an elevation of more than 1,000 feet above sea level.[171] However, elevation on Manhattan does not exceed 265 feet above sea level.[172] Portions of two of the Great Lakes – Lake Erie and Lake Ontario – are in the State. The Niagara River, with its falls, flows between those lakes and makes the State one of the nation's leading producers of hydroelectric power. The Great Lakes and Atlantic Ocean shorelines also provide significant wind resources.[173]

3.1.1 Physiography

The U.S. is divided into eight major physiographic regions, 25 provinces, and 86 sections, representing distinctive areas having common topography, rock types and structure, and geologic and geomorphic history.[174] New York overlaps three physiographic regions, with the majority of the State falling within the Eastern Appalachian Highlands region, which extends from New England south to Alabama and Georgia and west to the continental interior plains.

3.1.2 Geology

The locations of the State's electric infrastructure are influenced by its geology. Geology determines the types and distribution of soils, water drainage, topography and ecosystems. In turn, these factors impact land use, development, and population distribution, thereby directly influencing both the locations of energy resources, including renewable energy facilities, and the supporting transmission and distribution systems.

More directly, the buffering ability of bedrock geology, soils, and water can help limit the damage caused by acidic air pollutants released from sources such as electric generation, industrial activities, and transportation. The four types of geological features that provide pollution buffering in the State include: (1) shale and shale-sandstones, such as limestone; (2) granite; (3) sands and clays; and (4) soils. The ability of certain geologic features to buffer air pollutants from surrounding soils and surface waters depends on the amount of calcium carbonate released by natural weather and erosion processes. Geologic features resistant to such processes, such as granite in the Adirondack Mountains and Hudson Highlands, provide minimal buffering capacity due in part to a lack of calcium carbonate.

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[169] U.S. Census Bureau. State & County Quick Facts – New York. Accessed on October 7, 2024 at: https://www.census.gov/quickfacts/fact/table/US,NY/PST045216.

[170] Cornell University. The Climate of New York. Accessed on October 7, 2024 at: http://archive.today/UGwJ.

[171] *Ibid.*

[172] NYC Parks. Bennett Park – Highest Natural Point in Manhattan. Accessed on October 31, 2024 at: https://www.nycgovparks.org/parks/bennett-park/monuments/721.

[173] EIA. New York State Energy Profile. Accessed on October 7, 2024 at: https://www.eia.gov/state/print.php?sid=NY.

[174] U.S. Geological Survey (USGS). Physiographic divisions of the conterminous U.S. Accessed on October 7, 2024 at: https://catalog.data.gov/dataset/physiographic-divisions-of-the-conterminous-u-s.

Shale and shale-sandstones such as limestone provide the greatest buffering capacity. This bedrock dominates in the Appalachian Highlands, Hudson Valley, and the periphery of Tug Hill (in upstate New York).[175] Large areas of sandstone are found in narrow bands of bedrock along the northern edge of the Appalachian Highlands, the south shore of Lake Ontario, the St. Lawrence River plain, and the Catskill Mountains. Several long, narrow bands of limestone bedrock are also found in the periphery of the Adirondacks, and along the Lake Ontario plain, the St. Lawrence River plain, and the escarpment located south of the Mohawk River and west of the lower Hudson River. Large areas of limestone bedrock also occur at both the northern edge of the Hudson Highlands and along the Taconic Mountains. Although sands and clays erode rapidly, these geologic features, underlying most of Long Island, are primarily composed of silicates, which do not generate significant amounts of calcium carbonate and therefore provide little buffer to acidic pollution. New York City lies along the New York Bight, the expanse of shallow ocean between the coast of New Jersey and Long Island.[176] New York City itself mainly comprises sedimentary formations of the Cretaceous, Tertiary, and Quaternary ages, situated primarily on the Atlantic Coastal Plain.[177]

3.1.3 Soil

Soil supports agriculture, buildings, and forestlands, sequesters carbon, and filters and buffers pollutants. The soil of New York is relatively young. Formed 21,000-10,000 years ago, mostly by glacial till, the State's soil is most agriculturally productive in valleys. Muck soils, lasting evidence of former glacial lakes, are known to be highly productive and found mainly between Rochester and Syracuse.[178] Honeoye soil, unique to the State, is especially productive due to its loamy textures, high water-holding capacity, good drainage, and fertility. Found on drumlins, till plains, and hills, it was developed as sediment deposited by glaciers combined with organic matter from plants and animals. It currently covers 500,000 acres in 15 counties in the Finger Lakes Region.[179]

3.2 Land Use

Land use is generally defined as the management and/or modification of the natural environment (or land) to support human uses. Existing land uses are a function of local topography. For example, the highlands of eastern New York form natural barriers to transportation and settlement. As such, most New Yorkers live in the lowland areas in between, including the Lake Champlain and Hudson River Valleys, and south of the Hudson Highlands, where the topography slopes down to sea level in New York City and Long Island.

In addition to topography, land use is also influenced by such factors as proximity to developed areas and transportation networks, past uses of the land, and general societal and economic trends. The scope and scale of development across the State ranges from urban and suburban, to rural and natural areas. **Figure 3-1** provides an overview of major land uses across the State. As shown, more than half of the State is forest and woodland (56 percent), while approximately 21 percent is active farmland or cropland. Developed areas, which consist primarily of residential, commercial, and industrial land uses, comprise approximately nine percent of the State.

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[175] For purposes of this GEIS, upstate New York is defined as areas that fall within NYCA Load Zones A-G and downstate as areas that fall within NYCA Load Zones H-K. Downstate is defined slightly differently in section 3.12.3, as a small portion of downstate Westchester County falls within NYCA Load Zone G.

[176] USGS. Geology of the New York City Region. Accessed on October 28, 2024 at: https://www.usgs.gov/geology-and-ecology-of-national-parks/geology-new-york-city-region.

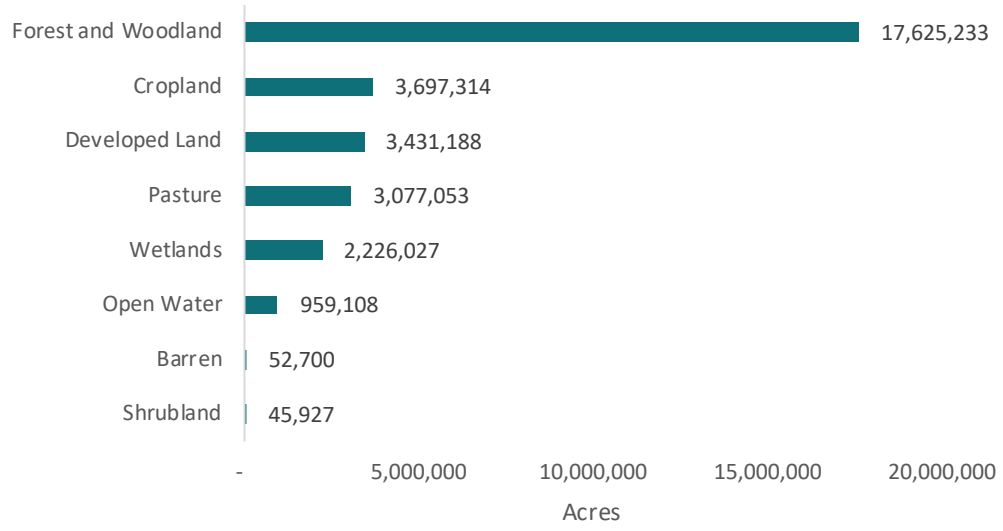
[177] *Ibid.*

[178] City University of New York. Soils of New York State. Accessed on October 29, 2024 at: http://www.geo.hunter.cuny.edu/courses/geog306.04_grande/7-Soils%20Handout.pdf.

[179] Soil Science Society of America. Honeoye New York State Soil. Accessed on October 29, 2024 at: https://www.soils4teachers.org/files/s4t/k12outreach/ny-state-soil-booklet.pdf.

New York City represents only about one percent of State's total land area but is home to approximately 45 percent of the State's residents. The majority of land in New York City is developed for residential, commercial, institutional, industrial, and mixed use. New York City's system of parks and open spaces – in all five boroughs – covers 14 percent of the city, totaling approximately 29,000 acres.[180]

Figure 3-1. New York State Land Use Summary[181]



3.2.1 Local Land Use Planning

New York State constitutional "home rule" provisions mean that land use in the State is primarily controlled at the smallest level of municipal government. Land use at the local level is primarily guided by zoning, which must be developed in accordance with a comprehensive plan. Comprehensive plans outline a community's long-range vision and goals for land use, development, and growth. Local zoning is the primary tool available to municipalities to guide future development within their boundaries to be consistent with local interests and priorities, and the vast majority of towns, villages, and cities in New York State have adopted a comprehensive plan and the related zoning.

Numerous statewide land use plans and resource management plans provide further guidance for local authorities on state-wide land use issues of importance (e.g., groundwater, coastal areas, etc.), including the Coastal Management Plan, Open Space Plan, and others. Both statewide plans and local land use and planning laws will likely have implications for the siting of renewable energy and transmission projects. For example, New York City's Department of City Planning pursues objectives related to neighborhood improvement, housing, economic development, resiliency and sustainability, land use reviews, and data and expertise. The City Planning Commission regularly holds hearings and votes on applications that relate to the use, development, and improvement of property that is subject to regulation by the City. Other cities, towns, and villages make land use decisions via planning and zoning boards.

[180] City of New York. A Stronger More Resilient New York: Chapter 11 Parks. Accessed on October 28, 2024 at: http://www.nyc.gov/html/sirr/downloads/pdf/final_report/Ch_11_Parks_FINAL_singles.pdf.

[181] National Agricultural Statistics Service. Cropland Data Layer 2023. Accessed on October 10, 2024 at: https://nassgeodata.gmu.edu/CropScape/.

3.2.2 Open Space and Recreation[182]

Over five million acres of land throughout New York State are protected from development. This open space, which ranges from municipal parkland to large forest preserves, provide a variety of benefits to the State's economy, culture, and environment, and to the well-being of its residents.

The size and usage of protected open space in New York State varies depending on the context, but in general, open space is defined as land that is free from intensive development for residential, commercial, industrial, or institutional use. Such spaces include forest land, wildlife sanctuaries, undeveloped coastal and estuarine lands, undeveloped scenic lands, waterfront trails, and state and local parkland. **Table 3-1** displays a distribution of protected open space by ownership in the State.

Table 3-1. Summary of Protected Areas in New York State[183]

Ownership	Acres	Percent Of Total
State Land	4,162,281	82%
Private Conservation Lands	433,462	9%
Federal Land	253,698	5%
Local Government	160,555	3%
Native American	87,442	2%
TOTAL	**5,097,438**	**100%**

The value of open space and parks is well-established. Studies have found that residential properties adjacent to public parks, open spaces, and recreation areas are typically valued up to 20 percent higher than comparable properties.[184] These benefits result in added tax revenues from increased land values near open space, reduction in governmental services on open space, recreation and tourism revenues, agricultural revenues, source water protection, storm water treatment, and pollution reduction, among other benefits.

Besides economic benefits, open space contributes to a greater quality of life for nearby residents, which also translates to added health benefits. Physical activity promotes health, and open space provides access to walking, riding, and hiking trails. In a meta-analysis of close to 150 studies examining eleven different types of greenspace exposure, access to open space was a significant contributor to improvements in self-reported health, type II diabetes, all-cause and cardiovascular mortality, diastolic blood pressure, salivary cortisol, heart rate, heart rate variability, HDL cholesterol, preterm birth, and small size for gestational age births.[185]

[182] NYSDEC. Final New York State Open Space Conservation Plan 2016. Accessed on October 10, 2024 at: https://dec.ny.gov/nature/open-space/2016-open-space-conservation-plan.

[183] Conservation Biology Institute. PAD-US 2.1 (CBI Edition) October 2012. Accessed on October 10, 2024 at: https://databasin.org/datasets/5824df6d0e8a4adc88be16640053dd6a.

[184] Parks and Trails New York. Economic benefits of the New York State Park System. Accessed on October 10, 2024 at: https://www.ptny.org/application/files/6515/0903/5031/Economic-benefits-of-NYS-parks.pdf.

[185] Twohig-Bennett, C., & Jones, A. 2018. The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes. *Environmental research*, 166, 628-637. Accessed on October 10, 2024 at: https://www.sciencedirect.com/science/article/pii/S0013935118303323.

3.2.3 New York State Open Space Conservation Program

The open space conservation program maintains broad public support throughout the State. This is a testament to the program's environmental, health, and economic benefits. In addition to outdoor recreational opportunities, goals of the open space conservation program include protecting plant and animal diversity to ensure viable ecosystems, protecting the drinking water supply and the water quality of aquatic ecosystems, improving the quality of life for the State's citizens, maintaining natural resource industries such as farming, forestry, fishing, and tourism, and combating global climate change and its potential effects.

To ensure citizen input into State land acquisition decisions, New York established a formal open space conservation program in 1990. New York State Department of Environmental Conservation (NYSDEC) and New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP) developed a comprehensive statewide Open Space Conservation Plan that covers conservation actions, tools, and cooperation with other participating State agencies, including the Department of State (DOS), the Adirondack Park Agency, the Department of Agriculture & Markets (DAM), and the Department of Transportation (DOT). Updated every three years, a revision of the 2016 plan was expected in summer 2024 but has yet to be released. The revised plan will address open space conservation activities within four critical priority areas: (1) promoting outdoor recreation; (2) addressing climate change; (3) ensuring clean water, air, and land for a healthy public and vibrant economy; and (4) protecting, using, and conserving our natural resources and cultural heritage.[186]

3.2.4 Agriculture

Agriculture is an important sector of the State's economy. According to the U.S. Department of Agriculture, milk is the State's largest agricultural commodity, ranking fifth nationally in sales in 2020.[187] New York is also a major producer of other agricultural products, including apples, maple syrup, wine, and grapes. Approximately nine percent of the State's agricultural receipts came from crops grown for animal feed in 2020.[188]

According to the U.S. Bureau of Economic Analysis, in 2021, agriculture in New York produced roughly $3.3 billion in gross domestic product and paid close to $1 billion in wages.[189] According to the New York Farm Bureau, there are over 30,000 farms in the State as of 2022 with an average farm size of 212 acres,[190] and 98 percent of farms in the State are family-owned.[191]

The overall number of farms in the State dropped by about 2,800 compared to 2017. The State also lost 364,000 acres of farmland in that period.[192] The average net income per farm in the State is $76,281, and the average producer age is 56.7 years.[193] **Table 3-2** below summarizes select characteristics of the State's agricultural industry.

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[186] NYSDEC. Draft Open Space Conservation Plan 2016. Accessed on October 22, 2024 at: https://www.dec.ny.gov/lands/98720.html.

[187] Office of the New York State Comptroller. New York's Agriculture Industry: A Resilient Part of State and Local Economies. Accessed on October 30, 2024 at: https://www.osc.ny.gov/reports/new-yorks-agriculture-industry-resilient-part-state-and-local-economies#:~:text=The%20agriculture%20industry%20supports%20jobs,U.S.%20Bureau%20of%20Labor%20Statistics.

[188] USDA Economic Research Service. Cash receipts by commodity 2023. Accessed on October 30, 2014 at: https://data.ers.usda.gov/reports.aspx?ID=17844#P632cfec7c5ad4fe4920cca39b63aada4_2_251iT0R0x48.

[189] Office of the New York State Comptroller. New York's Agriculture Industry: A Resilient Part of State and Local Economies. Accessed on October 30, 2024 at: https://www.osc.ny.gov/reports/new-yorks-agriculture-industry-resilient-part-state-and-local-economies#:~:text=The%20agriculture%20industry%20supports%20jobs,U.S.%20Bureau%20of%20Labor%20Statistics.

[190] New York Farm Bureau. New York Farm Bureau Statement on 2022 USDA Agriculture Census. Accessed on October 30 at: https://nyfb.org/news/press-releases/new-york-farm-bureau-statement-2022-usda-agriculture-census#:~:text=30%2C650%20farms%20in%20New%20York,slightly%20below%20the%20national%20average.

[191] New York Farm Bureau. New York Agriculture. Accessed on October 30, 2024 at: https://nyfb.org/about/about-ny-ag.

[192] *Ibid*.

[193] *Ibid*.

Of the State's total land area, 21 percent is in agricultural use. In certain counties in the Finger Lakes, Western New York, and Southern Tier, farmland accounts for more than 40 percent of total land area.[194]

Table 3-2. Select Characteristics Of New York State's Agricultural Industry[195]

Statistic	Value (2022)	Percent Change From 2017
Number of farms	30,650	-8.3%
Acres in production	6,502,286 acres	-5.3%
Average farm size	212 acres	3.4%
Total value of agricultural products sold	$8.04 billion	49.7%
Average net income per farm	$76,281	78%

3.2.5 Electric Industry Land Use

New York State's electrification and transmission buildout began in the late 19th century.[196] Over 80 percent of the State's transmission system was put into service before 1980.[197] Thus, while much of the state's transmission system was built prior to current environmental and land use laws and regulations being in place, the evaluation of transmission investments since then has been made with environmental protection in mind.

Transmission and distribution lines account for the majority of the electric industry's direct use of land in the State.[198] The statewide transmission system spans more than 180,000 acres plus a network of more than 10,000 overhead circuit miles and 800 underground circuit miles.[199] Thousands of electrical substations convert electricity from the high voltage transmission system to the low voltage distribution system, and thousands of additional miles of local distribution lines convey electric power from substations to customers.

The location and type of transmission and distribution utilities are influenced by setting and alternative land uses. In urban centers where land use is constrained, transmission and distribution facilities are often located underground. In areas beyond urban centers, transmission and distribution facilities are typically overhead, consisting of transmission and distribution conduit strung between poles (for distribution) and towers (for transmission).

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[194] Office of the New York State Comptroller. New York's Agriculture Industry: A Resilient Part of State and Local Economies. Accessed on October 30, 2024 at: https://www.osc.ny.gov/reports/new-yorks-agriculture-industry-resilient-part-state-and-local-economies#:~:text=The%20agriculture%20industry%20supports%20jobs,U.S.%20Bureau%20of%20Labor%20Statistics.

[195] USDA Census of Agriculture. Accessed on October 30, 2024 at: https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/New_York/.

[196] Thomas A. Edison Papers. Edison Electric Illuminating Company of New York, Company Details. Rutgers-New Brunswick School of Arts and Sciences. Accessed on December 1, 2024 at: https://edison.rutgers.edu/life-of-edison/companies/company-details/electric-light,-domestic/edison-electric-illuminating-company-of-new-york; Niagara Falls National Heritage Area. Tesla and Niagara Falls. Accessed on December 1, 2024 at: https://www.discoverniagara.org/tesla-and-niagara-falls.

[197] NYISO. 2019. NY Poised to Make Largest Grid Investment in 30 Years. Accessed on December 5, 2024 at: https://www.nyiso.com/-/ny-poised-to-make-largest-grid-investment-in-30-years#:~:text=More%20than%2080%25%20of%20the,transmission%20in%20the%20organization's%20history.

[198] Power generation facilities have additional land use impacts that are beyond the scope of this report.

[199] NYISO. 2024 Load and Capacity Data Gold Book. Accessed on October 11, 2024 at: https://www.nyiso.com/documents/20142/2226333/2024-Gold-Book-Public.pdf/170c7717-1e3e-e2fc-0afb-44b75d337ec6.

New York City has its own unique distribution infrastructure. The city receives electricity from both in-city-generated and imported power sources.[200] Consolidated Edison Company of New York, Inc. (Con Edison), which provides electricity to the vast majority of New York City residential and business customers, utilizes 62 area substations. The distribution system utilizes some 270,000 utility poles and 52,000 overhead transformers throughout the City, as well as a vast network of underground conduits, wires, and cables.[201]

Different electricity generation types require varying amounts of land for resource production, energy plants, transport and transmission, and waste storage. **Table 3-3** below shows the average acres of land required per mega-watt hour (MWh) of electricity produced in the U.S. for six energy sources.[202] Coal, natural gas, and nuclear power require the least acreage, approximately 12 acres per MWh of energy produced. Solar and wind are more land-intensive, using 43.5 and 70.6 acres per MWh, respectively. Hydroelectric power generated by large dams requires over 315 acres per MWh.

Table 3-3. Land Use by Electricity Source in Acres/MW Produced[203]

Electric Source	Acres per MW Produced
Coal	12.21
Natural Gas	12.41
Nuclear	12.71
Solar	43.50
Wind	70.64
Hydro	315.22

3.3 Water Resources

New York State's oceans and estuaries, wetlands, rivers and canals, lakes, and groundwater provide multiple recreational, economic, and environmental benefits. These resources intersect with energy generation and transmission in a number of ways, both direct and indirect.

3.3.1 Oceans and Estuaries

The southernmost part of the State sits on the shore of the Northern Atlantic Ocean. The Atlantic Ocean Basin covers an area of about 914 square miles of the State's statutory ocean territory.[204] The basin is primarily covered by water but includes the ocean front beaches along Long Island's south shore. The State's territorial waters are located within and extend out to three nautical miles from the shoreline of Long Island.

[200] NYC Mayor's Office of Climate and Environmental Justice. Systems. Accessed on October 11, 2024 at: https://climate.cityofnewyork.us/subtopics/systems/.

[201] Con Edison. Company History and Statistical Information. Accessed on October 11, 2024 at: https://www.coned.com/en/about-us/corporate-facts.

[202] Strata Policy. 2017. The Footprint of Energy: Land Use of U.S. Electricity Production. Assessed on November 26, 2024 at: https://docs.wind-watch.org/US-footprints-Strata-2017.pdf.

[203] *Ibid*.

[204] Atlantic Ocean Basin. Comprehensive Wildlife Conservation Strategy for New York. Accessed on October 30, 2024 at: https://extapps.dec.ny.gov/docs/wildlife_pdf/atlantictxt.pdf.

The New York portions of the Atlantic Ocean include part of the area of the North American continental shelf called the New York Bight. This triangular area of coastal ocean is an important habitat for hundreds of marine species up and down the eastern seaboard.[205] The Atlantic Ocean Basin is an important area for commercial and recreational fishing, beach recreation, and commercial shipping.

The ocean current mixes with freshwater rivers and streams that drain into the ocean around New York City and Long Island. The intersection between these two types of waters creates several distinct estuaries that flourish with marine life, including five estuaries that exhibit unique characteristics, namely the Long Island Sound, the Peconic Estuary, the Long Island South Shore Estuary Reserve, the New York/New Jersey Harbor, and the Hudson River Estuary. These areas are managed cooperatively by NYSDEC, the U.S. Environmental Protection Agency (EPA), other State agencies, and local municipalities.[206]

3.3.2 Wetlands

Wetlands are areas where water covers the soil or is present either at or near the surface of the soil all year or for varying periods of time during the year. There are two general categories of wetlands: coastal/tidal wetlands and inland or freshwater wetlands. The State has an estimated 2.4 million acres of wetlands, most of which are freshwater wetlands.[207]

Tidal wetlands include estuarine intertidal flats (mudflats, sand bars, and beaches), estuarine emergent wetlands (vegetated flats), low salt marshes that are flooded on a daily basis, and high salt marshes in intermittently flooded tidelands. Freshwater wetlands include emergent, scrub-shrub and forested wetlands, freshwater marshes, wet meadows, vernal pools, and seasonally inundated floodplains. The most common wetland cover type is forested (70 percent), followed by shrub/scrub (16 percent), emergent (nine percent), and wetland open water (five percent).[208]

Tidal wetlands line much of the saltwater shore, bays, inlets, canals, and estuaries of Long Island, New York City, and Westchester County. They also line the Hudson River in Westchester and Rockland Counties upstream to the salt line.[209] These wetlands receive their water from the ocean, streams, and groundwater seepage and are subject to hydrologic and salinity regimes that vary daily with the tides. Tidal wetlands provide a buffer for flooding and tidal erosion along the State's shoreline. NYSDEC's Division of Marine Resources estimates that there are 25,000 acres of tidal wetlands in the State.[210]

Most of New York's freshwater wetlands are located in the northern and western parts of the State. The Lake Plains and the Adirondacks region together constitute about 74 percent of total wetlands acreage.[211] The majority of the State's inland wetlands have formed in and around glacial lakes,[212] but wetlands also commonly

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[205] *Ibid*.

[206] NYSDEC. Oceans and Estuaries. Accessed on October 28, 2024 at: https://dec.ny.gov/nature/waterbodies/oceans-estuaries.

[207] NYSDEC. Status and Trends of Freshwater Wetlands in NYS. Accessed on October 30, 2024 at: https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program/status-trends-freshwater-wetlands#:~:text=New%20York%20has%20an%20estimated,wetlands%20in%20New%20York%20state.

[208] *Ibid*.

[209] NYSDEC. Tidal Wetlands Permit Program. Accessed on October 30, 2024 at: https://dec.ny.gov/regulatory/permits-licenses/waterways-coastlines-wetlands/tidal-wetlands-permit-program#:~:text=Tidal%20wetlands%20line%20much%20of,upstream%20to%20the%20salt%20line.

[210] NYSDEC. Wetlands Status and Trend Analysis of New York State Mid 1980's to Mid 1990's. Accessed on October 14, 2024 at: https://extapps.dec.ny.gov/docs/wildlife_pdf/wetstattrend2.pdf

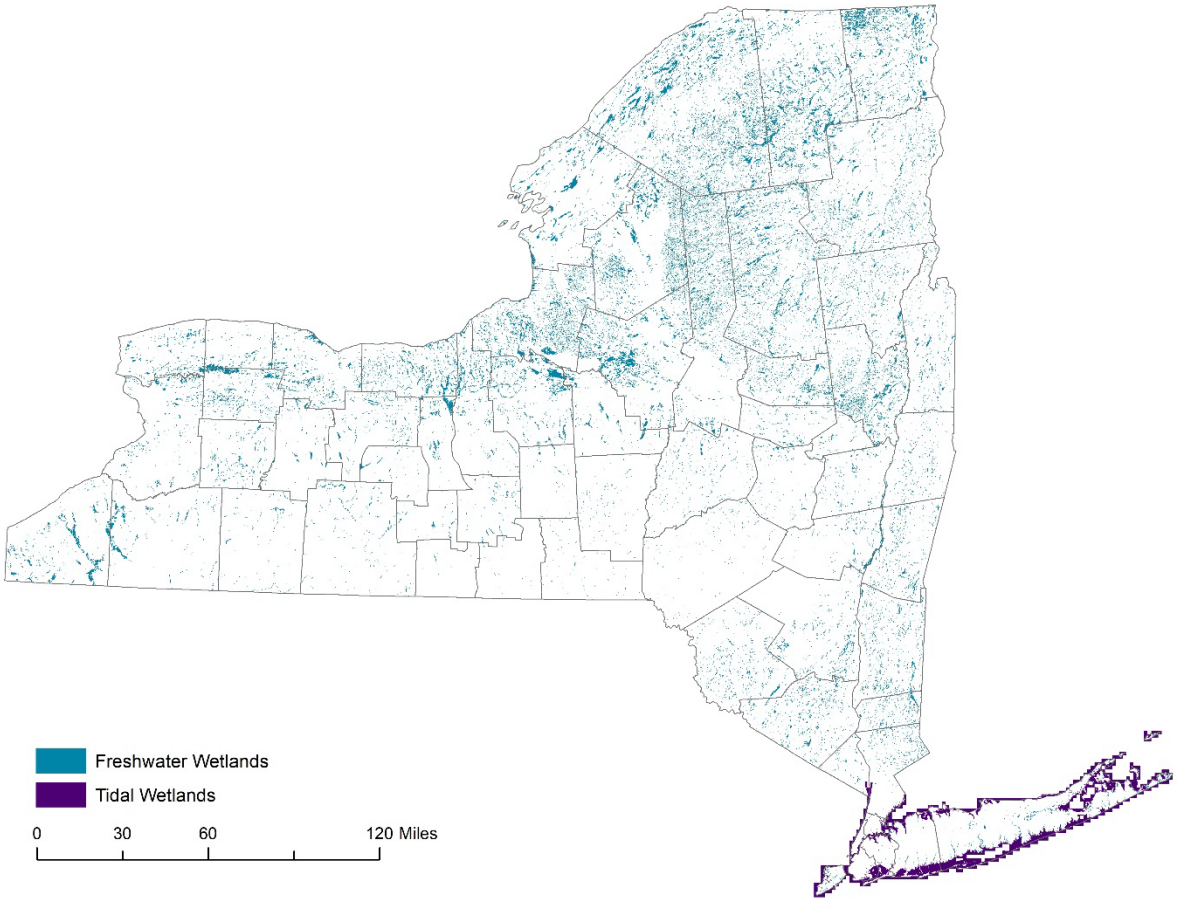
[211] NYSDEC. Status and Trends of Freshwater Wetlands in NYS. Accessed on October 30, 2024 at: https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program/status-trends-freshwater-wetlands#:~:text=New%20York%20has%20an%20estimated,Lake%20Plains%20and%20the%20Adirondacks.

[212] National Water Summary. Wetland Resources. Accessed on October 20, 2024 at: https://www.fws.gov/sites/default/files/documents/National-Water-Summary-Wetland-Resources-New-york.pdf.

occur along river and stream corridors. Groundwater and overland precipitation runoff are the primary sources of water for the glacial lake wetlands, and river flooding is an additional source of water for wetlands along rivers and streams.

Wetlands are biologically productive ecosystems, supporting more plants and animals and producing more organic material than adjacent aquatic or upland areas. Wetlands also provide critical flood and stormwater control and serve as groundwater discharge sites. In New York, public protection is afforded to tidal wetlands surrounding Long Island, New York City, and the Hudson River South of the Governor Mario M. Cuomo Bridge, and to freshwater wetlands found throughout the State.

Figure 3-2. Coastal And Freshwater Wetlands In New York State[213,214]



[213] NYSDEC. Regulatory Tidal Wetlands, April 24, 3034. Accessed on October 31, 2024 at https://data.gis.ny.gov/datasets/661acb5eaffb4be39b0d6d2203e636c3_1/explore?location=40.876031%2C-73.055095%2C8.63.

[214] NYSDEC. State Regulated Freshwater Wetlands, February 28, 3034. Accessed on October 31, 2024 at: https://data.gis.ny.gov/maps/a57e144caedb4b1aaf510809013e4ac7/about.

3.3.3 Watersheds

A watershed (also referred to as a drainage basin or catchment) is an area of land that drains all water (including rainfall) to a common outlet such as the outflow of a reservoir, mouth of a bay, or point along a stream channel. Watersheds include networks of rivers, streams, and lakes, the land area surrounding them, and the underlying groundwater. High elevation geographic features, such as mountains, ridges, and hills, separate watersheds and are referred to as drainage divides.

The U.S. is divided into 21 primary drainage regions, and the State is within portions of the Mid-Atlantic region and the Great Lakes region. Within the State, waters are drained by five major watersheds, which include the Allegheny, Delaware, Great Lakes-St. Lawrence, Hudson, and Susquehanna. Watersheds within the State are further divided into 17 sub-regional watersheds. NYSDEC manages the State's water resources at the sub-regional level.

Watersheds are often a unit by which water resources are managed because water quality and stream flow are affected by activities occurring within the land area that defines a watershed. For example, under the 1974 Safe Drinking Water Act (SDWA), intensive development activities are restricted in watersheds that provide source water for drinking water supplies. The largest of such areas, known as Source Water Protection and Wellhead Protection Program areas, is the New York City watershed, which includes large areas of the Catskill and Delaware watersheds west of the Hudson River and parts of Westchester and Putnam counties, which feed the Croton water supply east of the Hudson River.

3.3.4 Lakes, Rivers, and Canals

The State has more than 7,600 freshwater lakes, ponds, and reservoirs, portions of two of the five Great Lakes, and over 70,000 miles of rivers and streams.[215] Oneida Lake, the largest lake completely within the State, covers 51,243 acres.[216] The Finger Lakes are a group of 11 glacially created lakes located in central New York. In southeastern New York, the 18 reservoirs built to supply New York City with drinking water make up the bulk of the freshwater resource in the region. New York's Adirondack Park takes up most of the northeastern section of the state, and it contains over 3,000 lakes and ponds. The State also has over 59,300 rivers and streams within its borders. Some of the streams are intermittent, only flowing during wet periods. The Hudson River, which flows 301 miles from Lake Tear of the Clouds in the Adirondacks to New York Harbor, is the longest river completely in the State as well as the deepest.[217]

The State also has a network of over 500 miles of canals that connect major waterbodies within New York. The State's canal system includes the Erie Canal, Champlain Canal, Oswego Canal, and Cayuga-Seneca Canal.[218] The State's Canal System links the Hudson River with Lake Champlain, Lake Ontario, and Lake Erie via the Niagara River, allowing boaters to travel from the Atlantic Ocean to the Great Lakes.

The State's waterbodies supply drinking water, provide flood control, and support recreation, tourism, agriculture, fishing, power generation, and manufacturing, while providing habitat for aquatic plant and animal life. Lakes and rivers are managed through programs to protect and restore water quality which vary in scope.

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[215] NYSDEC. Lakes and Rivers. Accessed on October 30, 2024 at: https://dec.ny.gov/nature/waterbodies/lakes-rivers.

[216] NYSDEC. Waters of New York. Accessed on October 30, 2024 at: https://extapps.dec.ny.gov/docs/fish_marine_pdf/gsfishing7.pdf.

[217] *Ibid.*

[218] Erie Canalway National Heritage Center. The Canal System Today. Accessed on October 21, 2024 at: https://eriecanalway.org/learn/history-culture/canal-today.

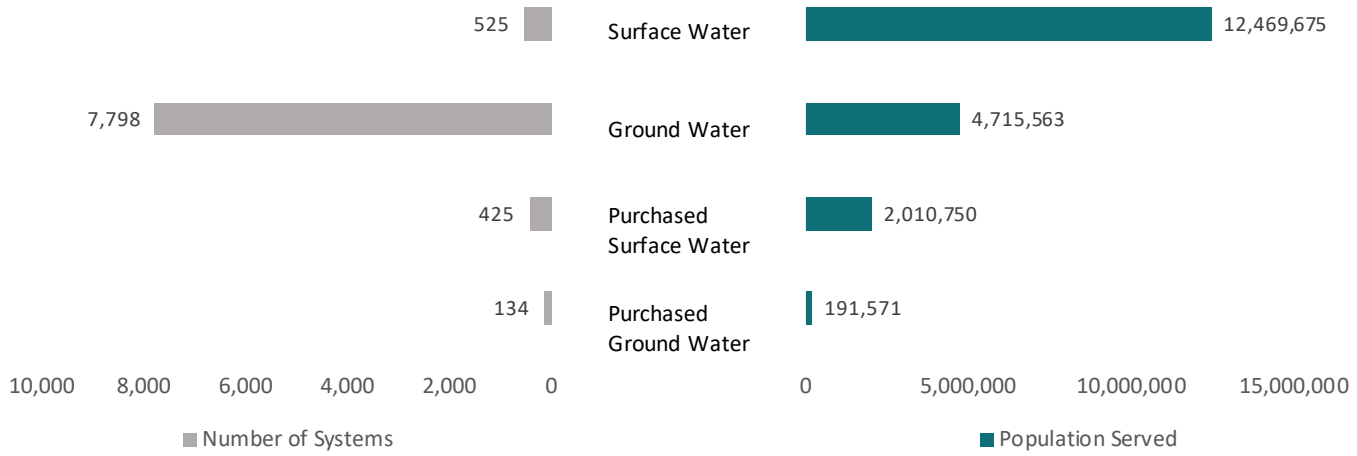
Some programs encompass multiple drainage basins, while others are locally focused on a smaller waterbody within a larger area.[219]

3.3.5 Drinking Water

Nearly 95 percent of all New Yorkers receive water from public water supply systems.[220] Public water supply systems vary in size. Mid-sized, privately-owned water supply companies serve municipalities, while the smallest systems include small stores in rural areas that serve customers water from their own wells. In total, there are nearly 9,000 public water supply systems in the State. The largest engineered water system in the nation belongs to New York City, whose system serves more than nine million people.[221]

As shown in **Figure 3-3,** the majority of the State's population is served by surface water. For example, the nine million people served by the New York City water system rely on surface water associated with New York City's large upstate reservoir and distribution system.

Figure 3-3. Summary Of New York Drinking Water Sources[222]



3.3.6 Groundwater

Groundwater – the water located beneath earth's surface in soil pore spaces and in the fractures of rock formations – occurs across all parts of the State. Approximately one quarter of New Yorkers rely on groundwater as a source of potable water.[223] Unconsolidated sediments (e.g., sand and/or gravel deposits) function as the State's most productive aquifers. Groundwater in these aquifers occurs under water-table (unconfined) or artesian (confined) conditions. A number of municipalities, industries, and farms have built over many of these aquifers because they typically form flat areas that are suitable for development with an ample

[219] NYSDEC. Lakes And Rivers. Accessed on October 28, 2024 at: https://dec.ny.gov/nature/waterbodies/lakes-rivers.

[220] New York Department of Health. Drinking Water Program: Facts and Figures. Accessed on October 14, 2024 at: https://www.health.ny.gov/environmental/water/drinking/facts_figures.htm.

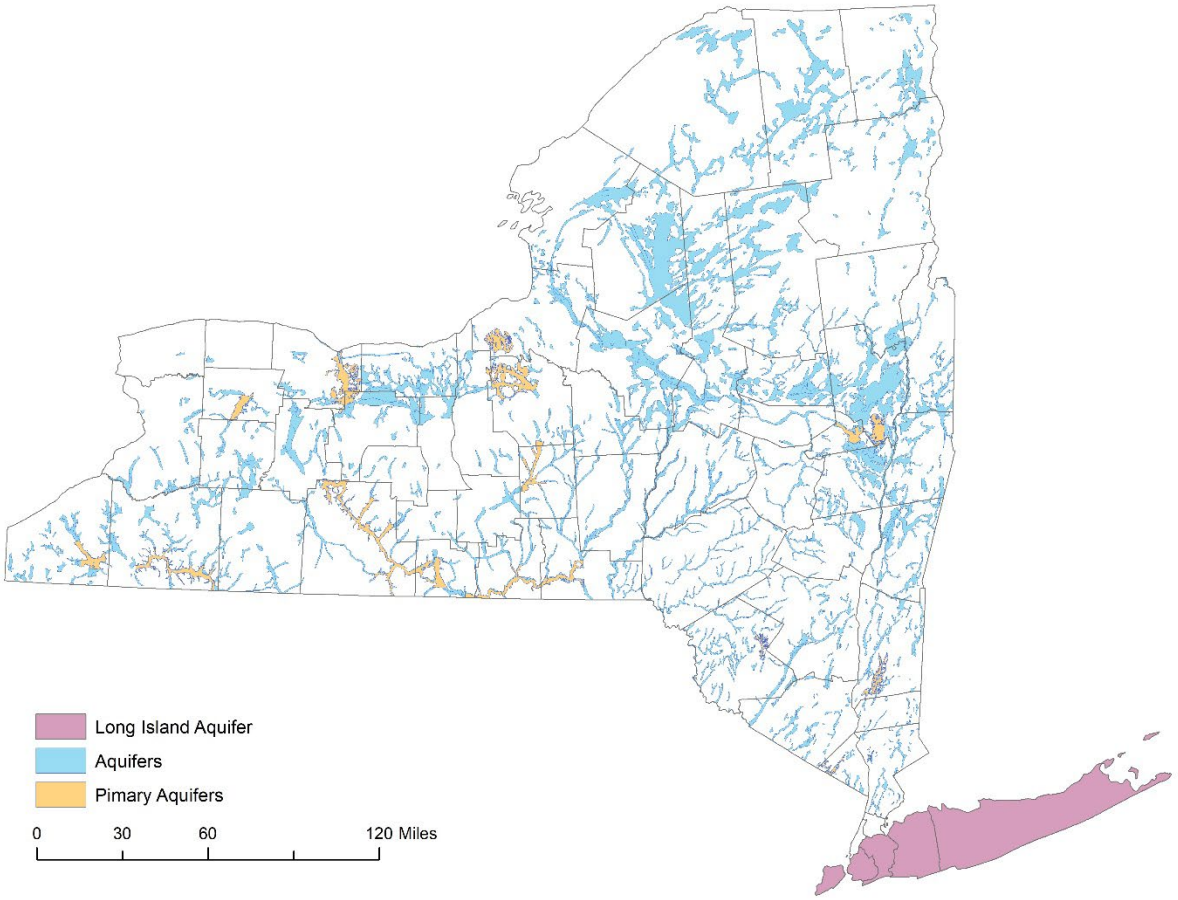
[221] *Ibid*.

[222] *Ibid*.

[223] NYSDEC. Groundwater. Accessed on October 14, 2024 at: https://dec.ny.gov/nature/waterbodies/groundwater.

groundwater supply.[224] To enable better management of the State's groundwater resources, NYSDEC works with the USGS to map the State's groundwater resources. **Figure 3-4** shows the general location of the State's unconsolidated aquifers. The orange areas identify areas of primary aquifers – areas capable of yielding a great deal of groundwater and, therefore, are also the State's more heavily utilized aquifers. The blue areas show the remainder of the unconsolidated aquifers in the State. These aquifers are not as heavily utilized but are capable of providing ten to 100 or more gallons per minute. Lastly, the pink area highlights the Long Island aquifer.[225]

Figure 3-4. Unconsolidated Aquifers in New York State[226]



3.3.7 Water Use

In 2015, the most recent year for which complete data are available, USGS estimated annual water withdrawals in the State at approximately 10.1 billion gallons per day (bgd). Uses for such withdrawals include drinking

[224] NYS GIS Clearinghouse. NYS Aquifers. Accessed on October 14, 2024 at: https://data.gis.ny.gov/datasets/440d57aa81d54e5188b632c6e257bcc5_0/explore?location=42.692799%2C-76.345538%2C7.00. *See also* USGS. Water Resources Mission Area – Water-Use Terminology. Accessed on October 30, 2024 at: https://www.usgs.gov/mission-areas/water-resources/science/water-use-terminology.

[225] NYSDEC. Groundwater. Accessed on October 14, 2024 at: https://dec.ny.gov/nature/waterbodies/groundwater.

[226] NYSDEC. NYS Aquifers. Accessed at: https://www.arcgis.com/home/item.html?id=ae13ed2af5814498977bb4acc6408686.

water, irrigation, industrial, and thermoelectric power.[227] The vast majority (76 percent or 7.7 bgd) of the State's total annual withdrawals (10.1 bgd) are for thermoelectric power.[228]

By contrast, New York City average water use in 2023 was estimated at just 0.99 bgd.[229] New York City water use has experienced a consistent downward trend since 1979, when average daily usage was estimated at 1.5 bgd.[230]

Flooding is considered a primary natural hazard to the State and a threat to 90 percent of the population. On average, each year the State experiences 83 flooding episodes at a cost of $135.7 million.[231] In September 2023, New York City was hit with a flash flood caused by record-breaking rainfall. Heavy rainfall caused runoff, flooding highways, streets, underpasses, and any low-lying drainage area. During the storm, rain overwhelmed the City's sewer system, sending floodwaters through streets. Major traffic and transportation systems experienced disruptions and damage. All three New York City area airports saw flight delays, and JFK Airport experienced a new rainfall record. Only three months prior, heavy rains caused historic flooding in part of the Hudson Valley. Orange and Rockland counties experienced nearly eight inches of rain, destroying roads, washing away infrastructure, homes, and tragically claiming a life. The flood caused major damage to the Popolean Bridge and completely washed out Route 218.[232]

Flooding impacts may increase with ongoing climate changes. One estimate found that not addressing coastal storm and flood-related events will cost the State $55 billion in the next decade. By 2045, more than $8.5 billion in residential property will be at risk of chronic flooding, and by 2100 damage could increase to $98 billion.[233]

3.3.8 Energy and Water Resources

Water is used in many forms of electric power generation to spin turbines directly (hydropower) or indirectly (steam-electric power) or for cooling generation equipment. Consequently, most of the State's electric power plants are located adjacent to major lakes, rivers, estuaries or coastal areas. The majority of the State's electric power is generated using water to cool steam used to spin turbines. Most plants built in the U.S. before 1970 operate with an open-loop (or once-through) cooling system.[234] In these systems, large volumes of water are withdrawn by the facility from an adjacent water body and returned to the source at a higher temperature. Both the extraction and return of water can result in environmental impacts. To minimize the adverse environmental impacts of such operations, Congress included Section 316(b) in the Clean Water Act (CWA), and New York State promulgated regulations (6 NYCRR part 704.5), which placed greater restrictions on once-through cooling systems to minimize the adverse environmental impacts of cooling water intake processes and identified closed-cycle cooling systems as the best available technology.[235]

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[227] USGS. Water Use Data for New York. Accessed on October 14, 2024 at: https://waterdata.usgs.gov/ny/nwis/wu.

[228] *Ibid*. USGS estimates that thermoelectric power in New York State withdraws 2,210 bgd of fresh water and 5,474 bgd of saline water.

[229] NYC Open Data. Water Consumption in New York City. May. Accessed on October 15, 2024 at: https://data.cityofnewyork.us/Environment/Water-Consumption-In-The-New-York-City/ia2d-e54m. The Open Data team is a partnership between the NYC Mayor's Office of Data Analytics (MODA) and the Department of Information Technology and Telecommunications (DOITT) to consolidate data from the state and city agencies of NYS. https://opendata.cityofnewyork.us/overview/.

[230] *Ibid*.

[231] Cornell University. All-hazards Preparedness & Response Education Program Flooding. Accessed on October 29, 2024 at: https://eden.cce.cornell.edu/natural-hazards/flooding/.

[232] MitigateNY. Flood Damage in New York State. Accessed on October 29, 2024 at: https://mitigateny.org/hazards_of_concern/flood.

[233] *Ibid.*

[234] EIA. Steam Electric Plant Operation and Design Report. EIA-767. 2005. Washington, DC.

[235] NYSDEC. Aquatic Habitat Protection. Accessed on October 15, 2024 at: https://dec.ny.gov/nature/animals-fish-plants/biodiversity-species-conservation/aquatic-habitat-protection.

After 1970, cooling towers, or closed-loop systems, became the more predominant cooling system for power generation. These systems operate by condensing generated turbine steam into hot water and then air-cooling the hot water in a tower, mechanically or by draft. The cooled water is collected and returned to the plant's boiler. Consumed water is evaporated in the cooling tower rather than being returned to the source watershed. Dry cooling mechanisms are also available and have been installed in several locations in the State over the last ten years. While water use and associated withdrawal and discharge impacts on waterbodies and associated ecosystem are reduced by dry cooling systems, they require higher energy usage and are currently more expensive than wet cooling systems.

Thermoelectric water withdrawals in the State are significant, accounting for approximately 71 percent (or 7.7 bgd) of total water withdrawals in 2015. As of 2015, almost all thermoelectric water withdrawals were from surface water sources, of which approximately 71 percent were from saline surface waters and 29 percent from fresh surface waters.[236, 237] Net power generation associated with thermoelectric-power water withdrawals totaled 89,400 gigawatt-hours (GWh) in 2015, the most recent year for which data are available.[238] This translates to an average withdrawal rate of approximately 15 gallons of water to produce one kilowatt-hour (kWh) of energy.

3.4 Climate Change and Air Quality

The climate of the State is broadly representative of the humid continental type, which prevails in the Northeast. Variation in climate across the State is driven by differences in latitude, topography, and proximity to large bodies of water. Due to its geographical position, the State is subject to a variety of air masses. Regional climate is driven by two countervailing air masses: cold air from the northern interior of the continent and humid air from the Gulf of Mexico and adjacent subtropical waters. The State is also affected by a third air mass flowing inland from the North Atlantic Ocean, which can produce cool, cloudy, and damp weather conditions. This maritime influence is particularly dominant in the southeastern portion of the State.

Moisture for precipitation is transported primarily from the Gulf of Mexico and Atlantic Ocean through circulation patterns and storm systems. Nearly all storm and frontal systems moving eastward across the continent pass through, or in close proximity to, the State. Storm systems that move northward along the Atlantic coast are of particular importance to the weather and climate of Long Island and the lower Hudson Valley. While statewide precipitation is distributed relatively evenly throughout the year (i.e., distinct dry or wet seasons are absent), the distribution of rainfall within the State varies based on local topography and proximity to the Great Lakes or Atlantic Ocean. Since 2000, New York City has experienced an average of 51.6 inches of precipitation annually.[239]

The State also receives an abundant amount of snowfall each year, the majority of which occurs in upstate New York. Snowfall varies widely across the State. In Albany, snowfalls averaged 51 inches over the last decade.[240] Northern portions of the state, such as the Northern Adirondacks, receive above 100 inches of snowfall on

[236] USGS estimates that 0.007 bgd of water withdrawals were from fresh ground waters in 2015.

[237] Dieter, C.A., Maupin, M.A., Caldwell, R.R., Harris, M.A., Ivahnenko, T.I., Lovelace, J.K., Barber, N.L., and Linsey, K.S., 2018, Estimated use of water in the United States in 2015. *U.S. Geological Survey Circular* 1441, p. 10, Accessed on October 15, 2024 at: https://doi.org/10.3133/cir1441.

[238] *Id*. p. 10.

[239] NOAA. 2024. Monthly & Annual Precipitation at Central Park. February. Accessed on October 15, 2024, at: https://www.weather.gov/media/okx/Climate/CentralPark/monthlyannualprecip.pdf.

[240] NOAA. 20224. Albany, NY – Seasonal Snowfall Totals (1884 – Present). Accessed on October 31, 2024 at: https://www.weather.gov/media/aly/Climate/ALY_Seasonal_Snowfall_Totals.pdf.

average with persistent snowpacks.[241] Snowfall in New York City and Long Island are tempered significantly by the Atlantic Ocean, which reduces snow accumulation to approximately 25 inches per year.[242]

The average annual mean temperature in New York City is 54.0°F.[243] The coldest year recorded in Central Park was in 1888 with an average annual temperature of 49.3°F – over eight degrees cooler than the warmest year in 2023 which had an average annual temperature of 57.9°F.[244] New York City temperatures of 90°F or higher often occur from late May to mid-September. Temperatures in urbanized areas of New York City can get even warmer due to the heat island effect, a term used to describe the increased air and structure temperatures in an urban area as opposed to noticeably lower temperatures in less developed settings.[245] The relative lack of trees and increased presence of dark materials such as cement results in increased solar energy absorption, leading to higher temperatures than would otherwise be found.[246] While climate change is discussed later in the chapter, the increased temperatures resulting from both the heat island effect and longer, hotter summers heighten the demand for electricity as City residents seek cooler temperatures through the use of air conditioning.[247]

3.4.1 Climate Change

Over the last century, the atmospheric concentrations of carbon dioxide and other heat-trapping greenhouse gases have rapidly increased. Combustion of fossil fuels (coal, oil, and natural gas) to generate energy is the greatest contributor to atmospheric carbon dioxide (CO_2) levels. Agricultural and other industrial processes also emit other greenhouse gases such as methane, nitrous oxide (NO_x) and halocarbons. Compared with other states, New York emits relatively low amounts of energy-related greenhouse gases (GHG) per capita (7.9 tons of carbon dioxide equivalent (CO_2)[248] per New Yorker in 2021).[249] This is due to a smaller proportion of the State's electric energy needs met by coal-fired power plants, and also to the widespread use of public transportation in the State's larger cities.[250]

As the concentration of greenhouse gases increases, more heat is trapped in the atmosphere, which causes an increase in temperatures. Over the last century, the State has experienced rising annual average temperatures. The fastest increases in State average temperatures occurred since 1970, with annual average temperatures rising approximately 3.0º F and winters warming three times faster than summers. By 2080, the State's average annual temperatures are projected to rise another 3º F compared to the 1970 temperatures.[251]

Because CO_2 and other greenhouse gases remain in the atmosphere for decades or even centuries, climate change is expected to continue even in the face of declining emissions. In response, a number of initiatives and

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[241] NOAA. Box and Whisker Graphs: Monthly Snow. Accessed on October 31, 2024 at: https://www.weather.gov/btv/climoSnowfall.

[242] *Id*.

[243] NOAA. Average Monthly & Annual Temperatures at Central Park February. Accessed on October 15, 2024 at: https://www.weather.gov/media/okx/Climate/CentralPark/monthlyannualtemp.pdf.

[244] *Id*.

[245] NYSDEC. Heat Island Effects. Accessed on October 15, 2024 at: https://www.dec.ny.gov/lands/30344.html.

[246] *Id*.

[247] NYISO. 2024 Power Trends. Accessed on November 19, 2024 at: https://www.nyiso.com/documents/20142/2223020/2024-Power-Trends.pdf/31ec9a11-21f2-0b47-677d-f4a498a32978?t=1717677687961.

[248] To report the total impact multiple greenhouse gases may have on climate, these figures are given in terms of carbon dioxide equivalent (CO_2e). The carbon dioxide equivalent for a gas expresses its climate-changing ability as a multiple of that of carbon dioxide. CO_2e is derived by multiplying the tons of the gas by its associated global warming potential, a measure of energy that the gas absorbs relative to carbon dioxide. (Source: EPA. Climate Change Terms. Accessed on October 15, 2024 at: https://sor.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=Glossary%20Climate%20Change%20Terms.

[249] EIA. Energy-Related CO2 Emission Data Tables. Accessed on October 15, 2024 at: https://www.eia.gov/environment/emissions/state/.

[250] EIA. New York State Profile and Energy Estimates. Accessed on October 15, 2024 at: https://www.eia.gov/state/analysis.php?sid=NY.

[251] NYSDEC. Climate Change Effects and Impacts. Accessed on October 15, 2024 at: https://dec.ny.gov/environmental-protection/climate-change/effects-impacts.

policies exist across the State public agencies and local communities to prepare for the significant risks that climate change poses to the State's communities and infrastructure. In 2015, New York City committed to reducing greenhouse gas emissions by 80 percent by 2050 in its OneNYC plan and has since aligned itself with the goals of the Paris Agreement, a global effort aimed at preventing average temperatures from rising above 1.5º C.[252] In 2019, New York City passed one of the most ambitious plans to decarbonize its buildings in the nation: Local Law 97 (LL97). Its goal is to reduce emissions produced by the city's largest buildings by 40 percent by 2030 and net zero by 2050.[253]

Also in 2019, the state legislature passed the Climate Leadership and Community Protection Act (CLCPA), which requires New York to reduce economy-wide GHG emissions 40% by 2030 and 85% by 2050 from 1990 levels.[254] In general, climate change is expected to make wet regions wetter and dry regions drier.[255] In the Northeast, rising air temperatures will intensify water cycles through increased evaporation and precipitation. The 2024 New York State Climate Impacts Assessment finds rising temperatures will lead to more frequent and severe heatwaves, increased flooding from heavier rainfall, coastal erosion from sea level rise, threats to public health from heat stress and vector-borne diseases, disruptions to agriculture and water supply, and challenges to infrastructure and economic stability.[256]

In the last 40 years, sea levels at the southern tip of Manhattan in New York City (aka The Battery) rose by 0.16 inches per year. Projections predict that sea level at The Battery may rise between 14-19 inches by the 2050s and 30-50 inches by the 2100s, relative to a 1995–2014 baseline.[257] **Figure 3-5** illustrates historical rates of sea level rise at this location in New York City.

Rising ocean temperatures also affect coastal areas of the State through an increase in severe coastal storms and rising sea levels. These two factors can alter sensitive coastal areas, increase the risk of property damage and harm to coastal residents, decrease the diversity of coastal species, and move saltwater further north in the Hudson River, potentially contaminating water supplies in those areas. Coastal flooding at three long-term tide gauge stations – The Battery, Kings Point, and Montauk – occurred two to five times more often during 2010–2022 as they did during 1950– 1969, in terms of average annual frequency.[258] Over 400,000 New Yorkers live within the 100-year coastal floodplain and therefore face risks from severe storm events.[259] The impacts of climate changes are expected to increase the vulnerability of the affected residents, especially those populations at the greatest economic and social disadvantages.[260]

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[252] City of New York. OneNYC 2050. Accessed on October 15, 2024 at: https://climate.cityofnewyork.us/reports/onenyc-2050/.

[253] NYC Mayors Office of Climate and Environmental Justice. Buildings. Accessed on October 31, 2024 at: https://climate.cityofnewyork.us/subtopics/buildings/

[254] NYSERDA. Greenhouse Gas Emission Reduction. Accessed on October 15, 2024 at: https://www.nyserda.ny.gov/Impact-Greenhouse-Gas-Emissions-Reduction.

[255] Adam, O., Shourky Wolff, M., Garfinkel, C. I., & Byrne, M. P. (2023). Increased uncertainty in projections of precipitation and evaporation due to wet-get-wetter/dry-get-drier biases. Geophysical Research Letters, 50(24), e2023GL106365. Accessed on October 15, 2024 at: https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2023GL106365. *See also* NYSERDA. Impacts of Climate Change on the New York Energy System. Report Number 23-30. December 2023. Accessed on November 19, 2024 at https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/23-30-Impacts-of-Climate-Change-on-the-New-York-Energy-System-acc.pdf.

[256] Stevens, A., & Lamie, C., Eds. 2024. New York State Climate Impacts Assessment: Understanding and preparing for our changing climate. Accessed on October 15, 2024 at: https://nysclimateimpacts.org.

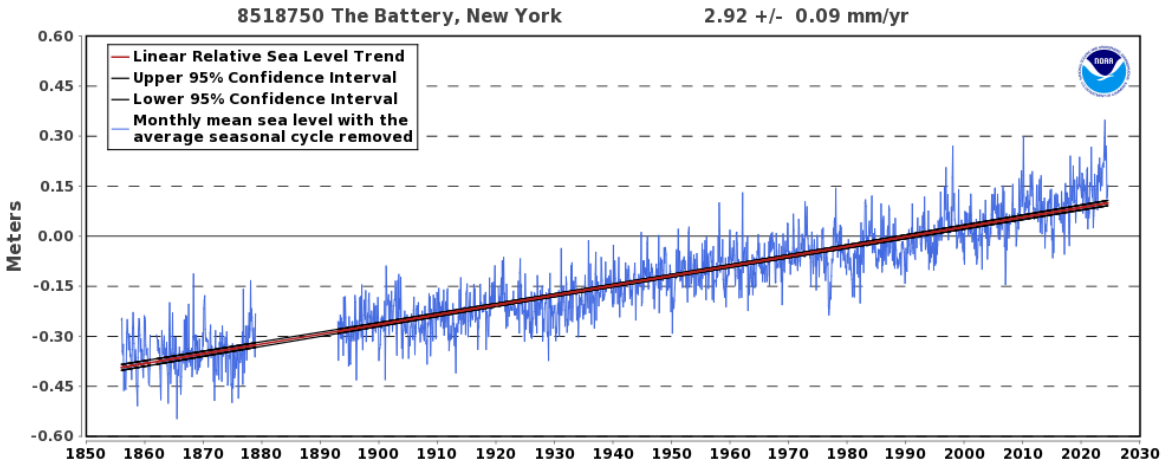
[257] *Id.*

[258] *Id.*

[259] NYC Planning. NYC's Floodplain by the Numbers. Accessed on October 15, 2024 at: https://www.nyc.gov/assets/planning/download/pdf/plans-studies/resilient-neighborhoods/floodplain-by-numbers.pdf.

[260] A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, USGCRP, 2023. Fifth National Climate Assessment. U.S. Global Change Research Program. Accessed on October 15, 2024 at: https://doi.org/10.7930/NCA5.2023.

Figure 3-5. Observed Sea Level in New York City[261]



Changing climate is also expected to generate both immediate direct and long-term impacts on the State's energy infrastructure. A transmission line's ampacity – or "carrying capacity" – declines as temperatures increase, meaning rising summer temperatures driven by climate change are likely to lead to reductions in transfer capacity across transmission systems. A 2023 NYSERDA study conducted across mild, moderate, and severe climate scenarios found that temperature rises could elevate New York State's transmission update costs between 3.6 percent and 9.3 percent.[262]

Extreme weather events, such as landslides, high winds, heavy precipitation, droughts, and wildfires, can inflict significant damage on the State's electricity generation, transmission, and distribution infrastructure. For example, in 2012 Hurricane Sandy left more than eight million customers without power.[263] Most of New York City had power restored within a few days as transmission and distribution lines were repaired, but some neighborhoods did not have power for weeks.[264] Disruptions to city life extended well beyond the damaged infrastructure. Primary power was lost and backup generators failed in many hospitals, causing widespread emergency evacuations of over 6,500 patients; elevators did not function in high-rise buildings, and water pumps did not have power, which often resulted in taps higher than the seventh floor going dry.[265] When public transportation systems had to shut down due to lack of power, many residents were unable to commute to work. The estimated $19 billion in damages encompass not only the direct damages to infrastructure, but also the unavoidable disruption to city life and commerce.[266]

[261] NOAA Tides & Currents. Relative Sea Level Trend 8518750 The Battery, New York. Accessed on October 16, 2024 at: https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8518750.

[262] NYSERDA. Impacts of Climate Change on the New York Energy System. Report Number 23-30. December 2023. Accessed on November 19, 2024 at https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/23-30-Impacts-of-Climate-Change-on-the-New-York-Energy-System-acc.pdf.

[263] United States Government Accountability Office. Climate Change – Energy Infrastructure Risks and Adaptation Efforts. Accessed on October 16, 2024 at: http://www.gao.gov/products/GAO-14-74.

[264] NYCEDC. A Stronger, More Resilient New York. June. Accessed on October 16, 2024 at: https://s-media.nyc.gov/agencies/sirr/SIRR_spreads_Hi_Res.pdf.

[265] *Ibid*.

[266] *Ibid*.

On Christmas Eve of 2022, a winter storm hit Western New York, concentrating on the city of Buffalo. Over 104,000 customers lost power statewide, including over 33,000 in Erie County alone.[267] Heavy snow and high winds caused falling trees to bring down power lines, and critical components of substations failed.[268] Due to the paralyzing weather conditions, key utility partners were unable to safely travel and repair or access critical infrastructure or households without power.[269] Some residents had no power until December 28, facing the freezing temperatures for four days after the storm began.[270] Outages were reported city- and region-wide, and multiple substations froze and went offline in Buffalo's East Side, home of several predominantly Black communities.[271]

Over longer timeframes, climate change is expected to decrease the efficiency of energy generation while increasing the demand for electricity, which may cause supply issues.[272] For example, increased storm activity, higher temperatures, and variable water availability can adversely affect natural gas and oil extraction, particularly in coastal areas. Warming temperatures can also adversely affect transmission efficiency and capacity. Renewable energy generation dependent on water resources, wind patterns, or solar radiation is also susceptible to changes in climate. **Table 3-4** summarizes potentially negative impacts of climate change on different types of renewable energy resources and energy storage.

New Yorkers may also face public health risks as the ambient environment changes. In particular, researchers expect heat-related deaths to increase at a faster rate than cold-related deaths. Rising temperatures and increased emissions will exacerbate existing air quality issues. Increased smog, larger and more frequent wildfires, and a greater volume of pollens and molds will serve to aggravate cardiovascular and respiratory illnesses, including asthma.[273]An estimated 350 New Yorkers die prematurely because of hot weather each summer on average.[274] A study by Columbia University estimates that the annual heat-related deaths in New York City in 2080 could be as low as 167, or as high as 3,331, depending on different scenarios of climate change adaptations and population growth.[275]

[267] NYS Division of Homeland Security and Emergency Services. New York State Preparedness and Response Efforts – Blizzard of 2022 After-Action Review. Prepared by Guidehouse. August 2023. Assessed on November 29, 2024 at: https://www.dhses.ny.gov/system/files/documents/2023/08/nys-aar-on-buffalo-blizzard-response.pdf.

[268] *Ibid*.

[269] *Ibid*.

[270] *Ibid*.

[271] *Ibid*.

[272] EPA. Climate Change Impacts on Energy. Accessed on October 16, 2024 at: https://www.epa.gov/climateimpacts/climate-change-impacts-energy.

[273] A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, USGCRP, 2023. Fifth National Climate Assessment. U.S. Global Change Research Program. Accessed on October 15, 2024 at: https://doi.org/10.7930/NCA5.2023.

[274] NYC Environment and Health Data Portal. 2024 NYC Heat-Related Mortality Report. Accessed on October 16, 2024 at: https://a816-dohbesp.nyc.gov/IndicatorPublic/data-features/heat-report/.

[275] Petkova EP, Vink JK, Horton RM, Gasparrini A, Bader DA, Francis JD, Kinney PL. 2017. Towards more comprehensive projections of urban heat-related mortality: estimates for New York City under multiple population, adaptation, and climate scenarios. *Environ Health Perspect* 125:47–55; Accessed on October 16, 2024 at: http://dx.doi.org/10.1289/EHP166.

Table 3-4. Potentially Negative Impacts of Climate Change on Renewable Energy Generation[276,277]

Technology	Potentially Negative Climate Change Effect
Hydropower	• Changes in precipitation • Increased temperature and evaporation
Solar	• Changes in haze, humidity, dust • Warmer temperatures affect effectiveness of photovoltaic electricity generation • Concentrating Solar Power may be negatively affected by droughts
Wind	• Extreme weather • Wind variability caused by changing weather patterns

3.4.2 Air Quality

New York State operates a comprehensive ambient air monitoring program.[278] Most of the State's air pollutants come from on- and off-road vehicles and power equipment; power plants that burn oil, gas, or coal; and industries that manufacture chemicals and other goods across the State. Routine activities, such as burning brush or heating with wood, may also temporarily affect air quality.[279] The Division of Air Resources within the NYSDEC measures air pollutants at 58 sites across the State, monitoring ozone (O_3), sulfur dioxide (SO_2), oxides of nitrogen (NO_x), carbon monoxide (CO), fine particulates with diameters less than 2.5 or 10 microns ($PM_{2.5}$ and PM_{10}), black carbon, and others.[280] Of these monitors, 21 are located in designated Environmental Justice areas.[281]

Air quality data is used to create an Air Quality Index (AQI) which correlates levels of different pollutants to one scale. This approach conveys the cleanliness of the air to the public and makes clear what associated health effects might be of concern. In 2018, New York State Ranked sixth of nine Northeastern States in AQI, with 10 Ozone Violation Days. Since 2000, the State's air quality has improved across several metrics for both upstate and downstate sites (**Figure 3-6**). According to the American Lung Association, the New York counties with the most "High Ozone Days" in 2024 are Suffolk (8.5), Queens (4.7), Bronx (3.0), New York (2.7), Richmond (2.7), Westchester (2.0), and Chautauqua (1.7).[282]

[276] Solaun, K., & Cerdá, E. (2019). Climate change impacts on renewable energy generation. A review of quantitative projections. *Renewable and sustainable energy Reviews*, *116*, 109415. Accessed on October 17, 2024 at: https://www.sciencedirect.com/science/article/pii/S1364032119306239.

[277] Ho, C. K., Roesler, E. L., Nguyen, T., & Ellison, J. (2023). Potential Impacts of Climate Change on Renewable Energy and Storage Requirements for Grid Reliability and Resource Adequacy. *Journal of Energy Resources Technology*, *145*(10). Accessed on October 17, 2024 at: https://asmedigitalcollection.asme.org/energyresources/article/145/10/100904/1164276.

[278] NYSDEC. New York State Ambient Air Monitoring Program. Accessed on October 30, 2024 at: https://extapps.dec.ny.gov/docs/air_pdf/2020networkassess.pdf.

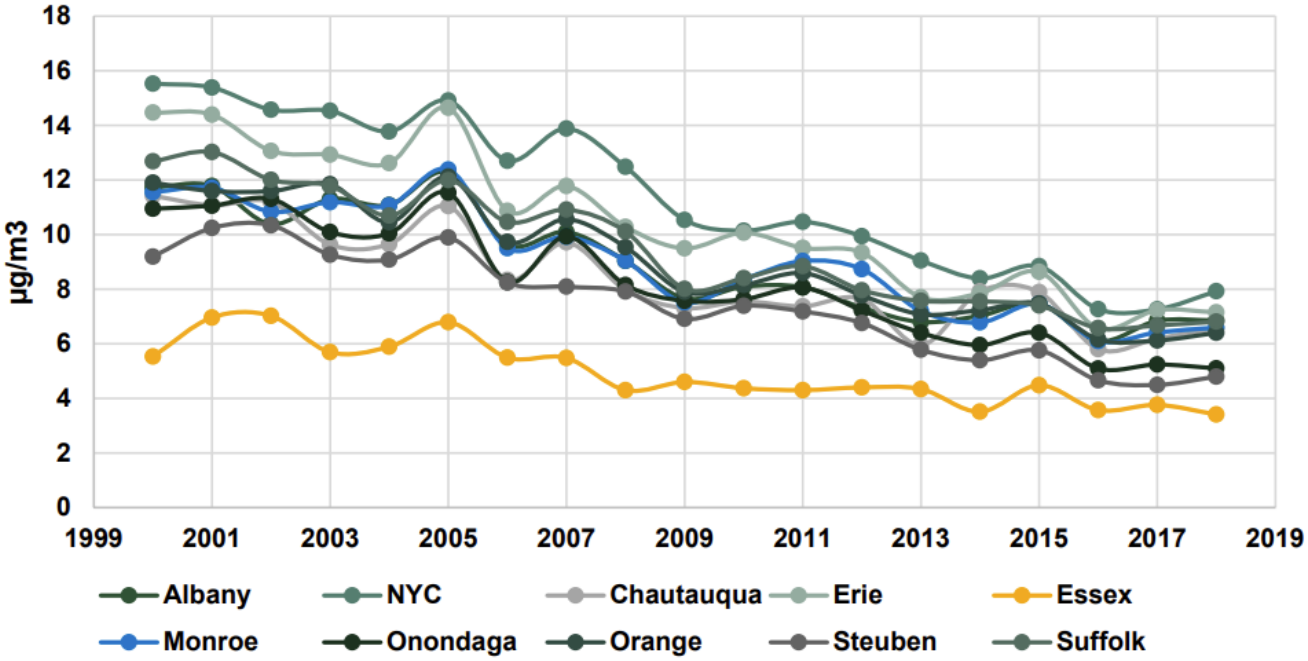
[279] NYSDEC. Environmental Protection – Air. Accessed on October 30, 2024 at: https://dec.ny.gov/environmental-protection/air-quality.

[280] NYSDEC. Program to Track Air Quality. Accessed on October 30, 2024 at https://dec.ny.gov/environmental-protection/air-quality/monitoring.

[281] NYSDEC. New York State Ambient Air Monitoring Program. Accessed on October 30, 2024 at: https://extapps.dec.ny.gov/docs/air_pdf/2020networkassess.pdf.

[282] Note: New York reports data on 24 out of 62 counties. Counties with no ozone data are not considered. American Lung Association. Report Card: New York. Accessed on October 31, 2024 at: https://www.lung.org/research/sota/city-rankings/states/new-york.

Figure 3-6. Annual Mean $PM_{2.5}$ Mass Across New York State by Area[283]



3.5 Plant and Animal Species and Biodiversity

The biodiversity of the state includes all different species of animals, plants, fungi, microorganisms, and bacteria. The total number of species in the State is uncertain, but tens of thousands of plants and animal species have been identified to date.[284]

3.5.1 Wildlife, Threatened and Endangered Species

The New York Natural Heritage Program (NYNHP) maintains a comprehensive database on the status and location of rare species and natural communities. The NYNHP currently monitors 182 natural community types, 869 rare plant species, and 482 rare animal species throughout the State, including mollusks, fish, insects, mammals, amphibians, reptiles, and birds.[285] Of protected animal species, 54 are state-listed as endangered, 35 are state-listed as threatened, and 58 are state-listed as species of special concern (i.e., any native species for which a welfare concern or risk of endangerment has been documented in the state).[286] Of the rare plant species, 349 are state-listed as endangered, 155 state-listed as threatened, 86 state-listed as rare, and 153 are state-listed as vulnerable.[287] According to the U.S. Fish and Wildlife Service (USFWS), 10 federally-listed threatened and endangered plant species are present in the state. Of the 10 federally-listed plant species, two species are

[283] Note: NYC = Mean of Measurements across the 5 boroughs, Manhattan, Bronx, Queens, Brookly, and Staten Island. NYSDEC. New York State Ambient Air Monitoring Program. Accessed on October 30, 2024 at: https://extapps.dec.ny.gov/docs/air_pdf/2020networkassess.pdf.

[284] NYSDEC. Biodiversity & Species Conservation: Sustaining New York's Animals, Plants and Ecosystems. Accessed on October 15, 2024 at: http://www.dec.ny.gov/animals/279.html.

[285] NYNHP. Information Management. Accessed on October 15, 2024 at: https://www.nynhp.org/information-management/.

[286] NYSDEC. Part 182: Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern; Incidental Take Permits. Accessed on October 15, 2024 at: https://www.dec.ny.gov/animals/7494.html.

[287] New York State. 6 CRR-NY 193.3 Protected native plants. Accessed on October 15, 2024 at: https://govt.westlaw.com/nycrr/Document/I21efe775c22211ddb7c8fb397c5bd26b?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=%28sc.Default%29.

endangered and eight species are threatened. According to the USFWS database, the state has 27 federally-listed threatened and endangered animal species, of which 15 species are endangered and 12 species are threatened.[288]

3.5.2 Forest Resources

In total, 18.6 million acres, or 61 percent of total state land area, is forested.[289] There are more than 100 species of trees, with maple, birch, and beech making up 53 percent of total forest land area.[290] 14.4 million acres are privately owned, while over 3.7 million acres are publicly owned and managed by NYSDEC's Division of Lands and Forests.[291] The majority of these publicly owned and managed forests, including the Adirondack and Catskill Forest Preserve, and other State Forests, Unique Areas, and properties designated as part of the State Nature and Historic Preserve, are maintained for recreation. The NYSDEC also holds conservation easements on more than two million additional acres of open space, including forested land. The NYSDEC New York State Police Aviation Unit and the NYSDEC conduct a two-month aerial forest survey each summer. The data is used for both state level forest management and tracking of possible causal agents that threaten forests nationally.[292]

The state's forests are important economic resources. According to the U.S. Census, forest product-related manufacturing and services contribute $14 billion to the State economy, including $1.9 billion from forest-related tourism.[293] In 2019, the forest products sector produced 517 million board feet of logs and 1.6 million green tons of pulpwood and wood chips.[294] Over 85 percent of pulpwood and wood chips consumed by operating mills were harvested within the state.[295] According to the 2024 Summer Stumpage Report, the most recent available, 18 percent of production was exported.[296] Exports are mainly bound for Canada and neighboring states.

Forests are a valuable source of natural carbon capture. As of 2020, state forests were storing approximately 1,976 million metric tons of carbon.[297] Net carbon storage in the state has decreased in recent decades. If trends continue, annual uptake of carbon dioxide would be 20 percent lower in 2050 compared to 1990.[298] In New York City, forested natural areas make up a quarter of the total tree canopy but account for 69 percent of total carbon stored and 83 percent of total carbon sequestered in trees across the city.[299]

3.5.3 Critical Environmental Areas

Critical Environmental Area (CEA) is a designation recognizing a specific geographic area for distinct benefit or threat to human health; exceptional or unique natural setting; exceptional or unique cultural value; or inherent

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[288] U.S. Fish and Wildlife Service. Listed species with spatial current range believed to or known to occur in New York. Accessed on October 15, 2024 at: https://ecos.fws.gov/ecp/report/species-listings-by-state?stateAbbrev=NY&stateName=New%20York&statusCategory=Listed.

[289] NYSDEC. Forests. Accessed on October 29, 2024 at: https://dec.ny.gov/nature/forests-trees.

[290] *Ibid*.

[291] *Ibid*.

[292] NYSDEC. Forest Health. Accessed on October 29, 2024 at: https://dec.ny.gov/nature/forests-trees/forest-health.

[293] NYSDEC. Forests. Accessed on October 29, 2024 at: https://dec.ny.gov/nature/forests-trees.

[294] NYSDEC. New York State Industrial Timber Harvest Production and Consumption Report-2019. Accessed on October 29, 2024 at: https://extapps.dec.ny.gov/docs/lands_forests_pdf/timberharvestreport.pdf.

[295] *Ibid*.

[296] NYSDEC. Stumpage Price Report Summer 2024. Accessed on October 29, 2024 at: https://dec.ny.gov/sites/default/files/2024-07/2024summerspr105.pdf.

[297] NYSDEC. New York State Forest Action Plan December 2020. Accessed on October 29, 2024 at: https://extapps.dec.ny.gov/docs/lands_forests_pdf/nysfap.pdf.

[298] *Ibid*.

[299] Natural Area NYC. Calculating Carbon Storage and Sequestration in New York City's Natural Area Forests. Accessed on October 29, 2024 at: https://naturalareasnyc.org/wp-content/uploads/2024/01/carbon-report_handout_final_august5.pdf.

ecological, geological, or hydrological sensitivity to change.[300] CEAs are defined under subdivision 6 NYCRR 617.14(g) of SEQRA regulations. Counties, municipalities, and state agencies may designate specific geographic areas within their boundaries as CEAs. New York currently has 226 CEAs.[301] The purpose of the CEA designation is to alert landowners, developers, and regulatory agencies to features of importance or concern. The process encourages proactive planning to conserve critical resources, avoid hazards, and consider broad scope issues like habitat connectivity and watershed protection.[302]

3.6 Aesthetic and Visual Resources

New York contains a geographically diverse landscape, distinguished by its mix of mountains, forests, rivers and streams, ponds and deep glacial lakes, waterfalls, islands, barrier beaches, tidal estuaries, wetlands, and ocean shore lands. Aesthetic resources and scenic quality are typically defined by a combination of landscape characteristics and viewer activity and sensitivity. Some of these resources enjoy official designation, while others are simply perceived as attractive or sensitive to visual change. Existing aesthetic quality is often described by considering landscape character types, the expectations of different viewer groups, and official designations – typically assigned by some governmental body – recognizing a resource or site as having aesthetic value or sensitivity. Owing in part to New York State's unique visual and aesthetic landscape and resources, tourism is one of the state's most important industries.

3.6.1 Landscape Similarity Zones

New York State's landscape is varied, ranging from mountainous forests to level farmland, and from small rural hamlets to major metropolitan cities. Within this varied landscape, areas of similar landscape character are referred to as "landscape similarity zones." As shown in **Table 3-5,** the State has 18 landscape similarity zones. Each zone exhibits a distinct combination of vegetation, topography, water, and land use that defines its aesthetic quality.

Table 3-5. New York State Landscape Similarity Zones

New York State Landscape Similarity Zones		
• Undeveloped coastlines	• River valleys	• Suburban commercial areas
• Developed coastlines	• River gorges	• Urban downtowns
• Wooded hills	• Rural agricultural land	• Urban residential areas
• Forested mountains	• Rural hamlets	• Urban commercial areas
• Undeveloped lakeshores	• Villages	• Industrial areas
• Developed lakeshores	• Suburban residential areas	• Highway corridors

3.6.2 Viewer Groups

The importance of scenic resources is determined in part by their accessibility and the sensitivity of their viewers. A resource may be more valuable if it is readily available and viewed by many people. The value of an aesthetic or scenic resource varies from viewer to viewer, depending on each viewer's expectation of scenic quality or sensitivity to visual change. **Table 3-6** summarizes the five general types of viewer groups that occur

[300] NYSDEC. Critical Environmental Areas. Accessed on October 29, 2024 at: https://dec.ny.gov/regulatory/permits-licenses/seqr/critical-environmental-areas.
[301] *Ibid*.
[302] Hudson River Estuary Program. Critical Environmental Areas Tools for Conservation in Your Community. Accessed on October 29, 2024 at: https://extapps.dec.ny.gov/docs/remediation_hudson_pdf/ceafactsheet.pdf.

within the State. These groups are not, however, mutually exclusive; that is, viewers may fall into more than one category over the course of their life.

3.6.3 Visually Sensitive Resources

A number of sites throughout New York State are recognized for their aesthetic value under existing Federal, State, or local laws. At the State level, two existing frameworks define resources of aesthetic or visual value: (1) Section 49 of the New York State Environmental Conservation Law (ECL); and (2) a policy issued in 2000 and updated in 2019 by the NYSDEC. Each framework is discussed below in more detail.

Table 3-6. Viewer Groups in New York State

Viewer Group	Group Description
Local Resident	Local residents generally view the landscape from their yards, homes, and local roads. Except when involved in local travel, these viewers are likely to be stationary and have frequent or prolonged views of certain landscape features. Local residents may view the landscape from ground level or elevations (typically upper floors/stories of homes and apartment buildings). Residents' sensitivity to visual quality is variable and may be tempered by the aesthetic character/setting of their neighborhoods.
Business Employees	Business employees work primarily in commercial, industrial, and urban landscape settings. Except while traveling to and from their places of employment, business employees generally work indoors and are focused on their job responsibilities. They typically experience limited views of the surrounding landscape and have relatively low sensitivity to visual change.
Through-Travelers/ Commuters	Through-travelers and commuters view the landscape from trains or automobiles on their way to work or other destinations. Most views will be from street level, although travelers on bridges and overpasses are afforded elevated views of the surrounding area. Commuters and through-travelers are typically moving, have a relatively narrow visual field, and for the most part are preoccupied with traffic and the roadway. Their perception and sensitivity to visual change is therefore relatively low.
Recreational Users	Recreational users include local residents involved in outdoor recreational activities at parks, playgrounds, recreational facilities and in undeveloped natural settings such as forests, fields, and water bodies. This group includes those involved in competitive sports, snowmobilers, bicyclists, hikers, joggers, recreational boaters, hunters, fishers, and those involved in more passive recreational activities (e.g., picnicking or walking). Visual quality may or may not be an important part of the recreational experience for these viewers. However, scenery may be an especially important part of their recreational experience, and recreational users will often have continuous views of landscape features over relatively long periods of time. Their perception and sensitivity to visual change is therefore relatively high.
Tourists	Tourists come to certain areas of the State specifically to enjoy the cultural, recreational, and scenic resources. Tourists may view landscape features on their way to a destination or from the destination itself. Their sensitivity to visual quality and landscape character will be variable, depending on their reason for visiting an area, although this group is generally considered to have relatively high sensitivity to aesthetic quality. In many areas tourists will expect to see a variety of man-made features in the landscape, while in others, man-made features will be considered an intrusion into the natural landscape.

ECL Article 49 specifically designates and preserves areas of "scenic or natural beauty," as well as areas with particular "historical, archaeological, architectural, or cultural amenities." The ECL states that these assets are

fundamental to the development of the state's recreational opportunities, tourism industry, and community attractiveness, and further that they contribute to balanced economic growth and quality of life.[303]

In 2018, NYSDEC updated its 2000 policy, Assessing and Mitigating Visual and Aesthetic Impacts, guiding the evaluation of visual impacts potentially generated by proposed facilities. As part of this policy, NYSDEC defines several general categories of aesthetic resources that are considered "scenic resources of statewide significance." If a proposed facility is within the viewshed of a designated aesthetic resource, applicants are required to implement reasonable and necessary measures to eliminate, mitigate, or compensate for any adverse aesthetic or visual impacts identified.[304]

Recognition of aesthetic quality also occurs at the local level. Counties, towns, and villages may consider local parks and recreation facilities, heavily used roads, local scenic overlooks/corridors, water bodies, and public gathering places as visually sensitive resources and may officially designate them as such in local planning documents.

3.7 Cultural and Historic Resources

The State is home to a diverse array of cultural, historic, and archaeological resources, spanning prehistory through the modern era with elements of both the natural and anthropogenic environments. This section summarizes the State's cultural and historic resources, including, but not limited to, historic buildings, archaeological sites, burial grounds, Native American sacred sites, and other significant cultural resources.

3.7.1 National and State Registers of Historic Places

The National and State Registers of Historic Places (NRHP/SRHP) serve to document the historic significance of various buildings, sites, structures, objects (e.g., sculptures, statuary, etc.), and districts throughout the State. Eligibility for both registers is determined by the State Historic Preservation Office (SHPO) and is based on the property's age and level of historic significance, integrity, and context. There are 6,560 SRHP/NRHP-listed places in the State.[305] In addition, any SHPO-eligible properties that SHPO has identified but that are currently not listed on the SRHP/NRHP receive the same protections and consideration as SRHP/NRHP-listed properties. SHPO has also developed the Cultural Resources Information System (CRIS), a web-based information system created to provide public access to the State's historic and cultural resource databases. It also includes over two million pages of digital images, from NRHP documents to survey reports and archaeological inventory forms.[306]

The New York City Landmarks Preservation Commission is the authority delegated by SHPO to evaluate potential impacts on cultural and historic resources within New York City. The five boroughs together encompass over 38,000 landmark properties, including 1,463 individual landmarks, 123 interior landmarks, and 12 scenic landmarks. The majority of the protected properties are located in 157 historic districts and historic district extensions across the city.[307]

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[303] New York State Environmental Conservation Law. Article 49, Protection of Natural and Man-Made Beauty. Accessed October 31, 2024 at: https://www.nysenate.gov/legislation/laws/ENV/A49.

[304] NYSDEC. Assessing and Mitigation Visual Impacts. Division of Environmental Permits. DEP-00-2. July 31. Accessed August 1, 2014 at: https://extapps.dec.ny.gov/docs/permits_ej_operations_pdf/visualpolicydep002.pdf.

[305] NY Open Data. National Register of Historic Places. Accessed on October 17, 2024 at: https://data.ny.gov/widgets/iisn-hnyv.

[306] SHPO. CRIS: Overview. Accessed on October 17, 2024 at: https://cris.parks.ny.gov/CRISHELP/?context=60.

[307] NYCLPC. About LPC. Accessed on October 17, 2024 at: http://www1.nyc.gov/site/lpc/about/about-lpc.page.

3.7.2 National and Historic Landmarks

The National Historic Landmarks Program, administered by the National Park Service (NPS), recognizes 275 places within the State for their contribution to American history and culture.[308] Like the properties on the National and State Registers, National Historic Landmarks can include buildings, sites, objects, or districts; however, eligibility for the latter program requires a greater threshold of historic significance. National Historic Landmarks may include the following:

- Properties with the strongest association with a given historical event;
- The properties that best interpret the story of a given individual who played a significant role in the nation's history;
- Exceptional representations of a particular building or engineering technique or method, or building type; or
- Archaeological sites that may yield new and innovative information about the past.

National Historic Landmarks in the New York City area are numerous. Among these landmarks are the Gateway National Recreation Area; National Monuments such as the African Burial Ground, Castle Clinton, and Governors Island; National Historic Sites such as the Home of Franklin D. Roosevelt; and the National Parks of New York Harbor.[309]

3.7.3 Locally Designated Historic Sites

Many municipalities throughout the State also recognize buildings and sites that are historically significant. Local governments may also establish historic preservation committees, designate local landmarks, and grant protections for local historic and cultural resources identified in their communities. To date, the SHPO has approved the adoption of historic preservation ordinances by 76 local governments through its coordination of the federally sponsored Certified Local Government Program.[310]

3.7.4 Archaeological Resources

Archaeological sites in the State include both prehistoric Native American sites, which date back as far back as 12,000 years ago through 1,500 AD, and historic-period resources related to the settlement and development of the State since the arrival of European colonists and settlers. While the exact number of archaeological sites is unknown, SHPO records include approximately 23,000 archaeological sites,[311] while New York State Museum's records (consolidated with the SHPO's files) identify approximately 12,000 sites. Of these, approximately 560 sites are listed on the NRHP, and the SHPO has identified an additional 1,100 sites as eligible for and therefore receiving protection under the NRHP.[312]

The New York City Landmarks Preservation Commission (LPC) established the Archaeology Department in 2002, which reviews any proposed subsurface work that falls under environmental review regulations or is a landmark as defined by the LPC or NPS.[313] In addition, the Archaeology Department supervises the subsequent

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[308] NPS NHPL. List of NHLs by State. Accessed on October 17, 2024 at: https://www.nps.gov/subjects/nationalhistoriclandmarks/list-of-nhls-by-state.htm.

[309] NPS. Find A Park: New York. Accessed on October 17, 2024 at: https://www.nps.gov/state/ny/index.htm.

[310] SHPO. Certified Local Governments. Accessed on October 17, 2024 at: https://parks.ny.gov/shpo/certified-local-governments/.

[311] SHPO. The New York State Historic Preservation Plan 2021-2026. Accessed on October 18, 2024 at: https://parks.ny.gov/documents/shpo/preservation-plan/NewYorkStateHistoricPreservationPlan20212026.pdf.

[312] DPS and Ecology and Environment Inc. Indian Point Contingency Plan Final Generic Environmental Impact Statement. Accessed on October 31, 2024 at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B1CFCC090-1E99-4A8C-BC0C-56764C8985AD%7D.

[313] NYCLPC. Departments: Archaeology. Accessed on October 18, 2024 at: https://www1.nyc.gov/site/lpc/about/archaeology.page.

archaeology and appropriate mitigation if important archaeological resources are discovered.[314] An Archaeological Repository of artifacts discovered throughout the city is maintained by the Archaeology Department; 32 city-owned collections have uncovered over 100,000 artifacts.[315]

3.7.5 Indigenous Nations Resources

New York State has a rich legacy of cultural and historical resources connected to Indigenous nations. Today, eight federal and state recognized sovereign Indigenous nations are located in what is now New York State.[316] These nations include Algonquian Peoples (the Shinnecock and Unkechaug Nations) and the Haudenosaunee Confederacy, consisting of the Cayuga Nation of Indians, Oneida Indian Nation, Onondaga Nation, St. Regis Mohawk Nation, Seneca Nation of Indians, Tonawanda Band of Seneca, and Tuscarora Nation.[317] New York City has the largest and most diverse population of Indigenous people in the United States, and cities throughout New York have urban Indigenous populations.[318]

The NYSDEC states that it has a unique relationship with each of the nine Indigenous nations. Commissioner Policy 42 (CP-42) outlines how and when the agency interacts with these nations on three broad issues: natural resources, cultural resources, and subsistence resources.[319] Actions covering natural resources include those which affect the over 150,000 acres on which these nations reside, water or air quality of nation lands, and other natural resources of nation interest (e.g., wetlands, fisheries, wildlife, etc.).[320] Cultural resources include burials and archaeological sites. NYSDEC receives and reviews permits to disturb such lands, as well as projects that otherwise potentially impact these and other sites of cultural importance. Issues regarding subsistence resources – hunting, fishing, and gathering – must also move through the channels outlined by NYSDEC's CP-42.[321] When reviewing projects, policies such as the CP-42, State Historic Preservation Act, and Uniform Procedures Act, among others, preclude development that could risk degradation of these nations' lands.

3.8 Waste Management

In 2018, New York residents generated approximately 42.2 million tons of materials and waste, of which the majority was Construction and Demolition (C&D) waste (18.4 million tons, or 46 percent) followed by municipal solid waste (17.9 million tons, or 45 percent), with the remaining composed of non-hazardous industrial waste at five percent, and biosolids at four percent.[322]

Electricity generation creates both air pollution and solid waste. While some of the electric industry's solid waste is recycled, most is buried in landfills. In 2020, the State's ten Waste-to-Energy (WTE) facilities processed approximately four million tons of Municipal Solid Waste (MSW) and generated 2,528,260 MWh of electricity, delivering approximately two percent of the electric power generated in the State. These facilities also produced approximately 960,000 tons of non-hazardous combined ash (a combination of fly ash and bottom

[314] *Ibid*.

[315] NYCLPC. List of the Collections. Accessed on October 18, 2024 at: http://archaeology.cityofnewyork.us/collection/list-of-the-collections.

[316] New York State Museum. First Peoples. Accessed on October 31, 2024 at: https://www.nysm.nysed.gov/exhibitions/ongoing/first-peoples.

[317] New York State Education Department. Indigenous Education – Tribal Nations of New York State. Accessed on October 31, 2024 at: https://www.nysed.gov/indigenous-education/tribal-nations-new-york-state.

[318] New York State Museum. First Peoples. Accessed on October 31, 2024 at: https://www.nysm.nysed.gov/exhibitions/ongoing/first-peoples.

[319] NYSDEC. Indian Nation Consultation. Assessed on October 31, 2024 at: https://dec.ny.gov/about/dei/indian-nation-affairs/consultation.

[320] New York State Coalition Against Domestic Violence. Indigenous Nations and Territories in New York State. Accessed on October 31, 2024 at: https://www.nyscadv.org/what-we-do/projects-resources/domestic-violence-indigenous-peoples/recognized-indigenous-nations-and-territories-in-new-york-state.html.

[321] NYSDEC. Indian Nation Consultation. Assessed on October 31, 2024 at: https://dec.ny.gov/about/dei/indian-nation-affairs/consultation.

ash).[323] Electric utilities in the State also operate eight federally regulated coal ash ponds and landfills, containing more than seven million cubic yards of waste.[324]

3.9 Public Health

The State's energy system sustains public health infrastructure. Powering healthcare systems, especially in extreme weather, is important to the health of the State's citizens. Reliable electricity infrastructure enables patients to access their hospitals, pharmacies, clinics, and emergency response centers in times of need. Public health issues relating to the environmental impacts of transmission include asthma and air quality-related health concerns and exposure to hazardous materials, electric and magnetic fields (EMFs), and noise.

3.9.1 Air Pollutants

Air quality in the State has continued to improve since the promulgation of federal, State, and municipal control requirements for stationary and area sources, complemented by ongoing improvements in mobile source emissions and efficiency. For example, the average SO_2 levels in New York City declined by 97 percent between 2009 and 2022 as a result of legislation passed by the New York City Council in 2010.[325] While control technologies are required for new generating facilities, and the use of natural gas as a primary energy source (instead of oil or coal) has lowered emissions per kWh of generation, most of the largest individual emission sources in the State continue to be electricity generation plants. Most air quality control regions in the State are in attainment with national air quality standards, while ozone continues to be a priority for air quality planning purposes.[326] The counties that constitute New York City – specifically Bronx County, Queens County, Kings County, Richmond County, and New York County – are in serious nonattainment with 8-Hour ozone (2015 standard) classifications.[327]

3.9.2 Ozone

Ozone can have an adverse effect on human health. High ozone concentrations irritate nasal, throat, and bronchial tissues, as well as asthma. Ozone attacks certain components of the body's defense system, raising concerns about the effects of ozone exposure on the human immune system. High concentrations of ozone can also harm forests, thereby altering wildlife habitats, lowering crop yields, and damaging materials such as rubber, plastics, synthetic fibers, dyes, and paints.[328]

Ozone formation occurs most commonly over cities with large numbers of industries, power plants, and vehicles. In large urban areas, ozone mixes with other pollutants to create smog. Smog reduces visibility and can irritate and inflame eye tissues. Generally, hot and dry weather fosters smog production.

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[323] NYSDEC. 2020 Municipal Waste Combustion Summary Report. Accessed on October 22, 2024 at: https://extapps.dec.ny.gov/docs/materials_minerals_pdf/wtesumrpt.pdf.

[324] Earthjustice, NRDC, Toxic Coal Ash in New York: Addressing Coal Plants' Hazardous Legacy. Accessed on October 31, 2024. Available at: https://earthjustice.org/feature/coal-ash-states/new-york.

[325] New York City Environment and Health Data Portal. NYCCAS Report: 2008-2022. Accessed on October 31, 2024 at: https://a816-dohbesp.nyc.gov/IndicatorPublic/data-features/nyccas/.

[326] EPA. Current Nonattainment Counties for All Criteria Pollutants. Accessed on October 22, 2024 at: https://www3.epa.gov/airquality/greenbook/ancl.html.

[327] *Ibid.* Serious nonattainment for 8-Hour Ozone (2015 Standard) Classification means the area has a design value between 0.093 and 0.105 ppm. *See* https://www.epa.gov/green-book/ozone-designation-and-classification-information.

[328] EPA. Ozone Layer Protection. Accessed on October 22, 2024 at: https://www.epa.gov/ozone-layer-protection.

3.9.3 Particulate Matter

Particulate matter (PM) is a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles (liquid droplets or solids) over a wide range of sizes. PM is classified in terms of the particle's aerodynamic diameter. PM2.5 is particulate matter with an aerodynamic diameter of 2.5 microns or less. Elevated levels of PM2.5 in the atmosphere have been linked to serious health conditions in humans. Exposure to PM2.5 has been closely associated with increased hospital admissions and emergency room visits for heart and lung disease, increased incidence of respiratory disease, including asthma, decreased lung function, and premature death. Sensitive groups that appear to be at greatest risk of such effects include the elderly, individuals with existing cardiopulmonary disease, and children. Reductions in NO_x and SO_2 will in turn reduce the fine particulates formed from those emissions.

After several years of efforts to control pollution sources, the New York metropolitan area achieved compliance with EPA air quality standards for PM2.5, bringing the entire State into federal compliance in April 2014. From 2009-2017, New York City's mean annual average PM2.5 concentrations decreased 28 percent, and during the same time period there were only five air quality advisories for the general population, compared to fifteen from 2003-2009.[329] All counties in the State have since been in attainment for PM2.5 air quality standards.[330]

3.9.4 Asthma

Asthma is a chronic lung disease caused by restriction of the airways that can result from a variety of genetic and environmental factors. Chronic asthma is usually controllable with drugs that relax the constricted airways or block inflammation caused by allergens and irritants. Common triggers for acute attacks include, but are not necessarily limited to, tobacco smoke, dust mites, cockroach allergen, pets, molds, smoke, outdoor air pollution, which may come from power plant emissions, and other chemical irritants.[331] Nationally, one in 15 children suffers from asthma.[332] The New York State Asthma Dashboard indicates, in 2021, 9.1 percent of adults in New York City were affected by asthma.[333] Between 2019 and 2021 the rate of asthma emergency room visits for adults in New York City was consistently higher compared the rest of the State.[334] In 2015, an estimated 7 percent of children in New York City had asthma in the past year.[335] Rates of asthma across the State are highest among Latino and black children in 2021, with 9.2 percent and 8.2 percent of children being affected, respectively.[336]

3.9.5 Electric and Magnetic Fields

EMFs are generated by all electric currents, including kitchen appliances and cellular telephones, as well as power transmission lines. The health effects of EMFs and, specifically, extremely low frequency fields, which are generated when the direction of current flow in an alternating current (AC) line switches, have been studied since the 1970s. The National Cancer Institute conducted a scientific review of the existing health literature

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[329] New York City Environment and Health. 2019Breathe easy: NYC's air quality is improving. Accessed on October 22, 2024 at: https://a816-dohbesp.nyc.gov/IndicatorPublic/data-stories/breatheeasy/.

[330] EPA. Current Nonattainment Counties for All Criteria Pollutants. Accessed on October 22, 2024 at: https://www3.epa.gov/airquality/greenbook/ancl.html.

[331] Centers for Disease Control and Prevention. Asthma webpage. Accessed on October 24, 2024 at: https://www.cdc.gov/asthma/about/.

[332] Centers for Disease Control and Prevention. Asthma Data, Statistics, and Surveillance. Accessed on October 24, 2024 at: https://www.cdc.gov/asthma/asthmadata.htm.

[333] New York State Department of Health. New York State Asthma Dashboard. Accessed on October 24, 2024 at: https://apps.health.ny.gov/public/tabvis/PHIG_Public/asthma/reports/#state.

[334] *Ibid*.

[335] NYC Health. NYC Child Health Data. Accessed on October 24, 2024 at: https://a816-health.nyc.gov/hdi/epiquery/visualizations?PageType=tsi&PopulationSource=CHS&Topic=1&Subtopic=24&Indicator=Asthma%20(ever)&Year=2018.

[336] New York State Department of Health. New York State Asthma Dashboard. Accessed on October 24, 2024 at: https://apps.health.ny.gov/public/tabvis/PHIG_Public/asthma/reports/#state.

investigating whether a link between EMF exposure and cancer exists. The review examines literature exploring a connection between EMFs and cancer in both children and adults, and in both cases, the review notes that no consistent evidence for a causal link between EMF exposure and cancers has been found. The European Commission Scientific Committee on Emerging and Newly Identified Health Risks, which reviewed electromagnetic fields in 2015, found a slight increased risk of childhood leukemia with daily exposures to low frequency fields; however, these findings are not supported by experimental studies.[337]

While there are no national or New York State standards for occupational exposures, the New York State Public Service Commission (the Commission) has established two electric field strength standards:

- **Opinion 78-13** (issued June 19, 1978) established a limit for electric fields at the edge of a right-of-way (ROW), at three feet above ground level to 1.6 kilovolts (kV) per meter for electric transmission lines.
- **Interim Policy guidelines** (issued on September 11, 1990) limit magnetic fields at the edge of an ROW at three feet above ground level to 200 milligauss (mG) for transmission lines.

In addition to public exposures, the Occupational Safety and Health Administration (OSHA) monitors and sets international and industrial guidelines for worker safety.[338]

Currently, both urban and rural populations may experience limited exposure to EMFs. In urban areas, low levels of EMF exposure may occur in the home and workplace from appliances and as a result of proximity to power cables, although most cables are belowground or shielded, which can contain EMFs and thus reduce exposure further. Rural populations are also exposed to EMFs, albeit at relatively low levels, from overhead transmission lines, in addition to exposure in the home and workplace similar to urban populations. However, public exposure in both urban and rural settings is many thousands of times less than worker exposures because EMF strength diminishes with the square root of the distance from a power line and the cube root of the distance from a point source. For example, a magnetic field measuring 57.5 mG immediately beside a 230 kV transmission line measures just 7.1 mG at a distance of 100 feet, and 1.8 mG at a distance of 200 feet.[339]

3.9.6 Noise

Noise pollution is unwanted or disturbing sound that interferes with normal activities like sleeping and conversation or that disrupts/diminishes one's quality of life. Alongside federal regulations, the state has noise restrictions on construction equipment, boats, shooting ranges, motor vehicles, and trains.[340]

In New York City, nine of ten adults are exposed to excessive noise as defined by the EPA.[341] Long-term exposure can lead to increased stress, increased blood pressure, muscle tension, ulcers, fatigue, and sleep problems.[342] Over three million New York City residents reported noise as a cause of poor sleep in 2016-2017.[343] Nearly 2.5 million city residents reported that their sleep was disturbed by noise more than three times a

[337] National Cancer Institute. Electromagnetic Fields and Cancer. Accessed on October 24, 2024 at: https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet#q6.

[338] U.S. Department of Labor, Occupational Safety and Health Administration. Safety and Health Topics: Extremely Low Frequency (ELF) Radiation. Accessed on October 24, 2024 at: https://www.osha.gov/elf-radiation.

[339] National Institute of Environmental Health Sciences. Electric and Magnetic Fields. Accessed on October 24, 2024 at: http://www.niehs.nih.gov/health/topics/agents/emf/.

[340] Noise Free America. New York State Noise Related Statutes and Policies. Accessed on October 29, 2024 at: https://noisefree.org/wp-content/uploads/2017/12/new-york.pdf.

[341] NYU. Sounds of New York City. Accessed on October 29, 2024 at: https://wp.nyu.edu/sonyc/.

[342] NYC Health. Noise. Accessed on October 29, 2024 at: https://www.nyc.gov/site/doh/health/health-topics/noise.page.

[343] NYC Health. Effect of Noise and Light on Sleep in New York City. Accessed on October 29, 2024 at: https://www.nyc.gov/assets/doh/downloads/pdf/epi/databrief105.pdf.

week (85 percent of respondents were Black or Latino).[344] Section 24-202 of the administrative code of New York City, known as the Noise Code, restricts noise from construction activities, animals, food vending vehicles, air conditioners and circulation devices, music, refuse collection vehicles, and motor vehicles.[345] The Noise Code has been in effect since 2005, and from 2010 through 2015 the toll-free noise complaint number received over 1.6 million complaints.[346] The most common complaint was for residential music with over 600,000 calls.[347]

3.10 Community Character

Community character is the unique or distinct identity of a place. While community character is largely intangible, it can be influenced by shifts in population and regional economic patterns. A community's character is generally shaped by the confluence of a combination of elements, including local natural features, land uses, development patterns, population growth and density, and regional socioeconomic patterns.

Municipalities typically address the more tangible aspects of community character through comprehensive plans which are implemented through local land use regulations, including zoning. However, the intangible factors that make up community character as described by residents are difficult to define (or legislate). As a result, community character is sometimes associated with more definable community qualities such as demographics, population density, open space, air quality, land use and neighborhood compositions, or traffic patterns.

3.10.1 Population

New York is the fourth most populous state, behind California, Texas, and Florida. The U.S. Census estimated the population of the State at 19,571,216 on July 1, 2023, a 2.7 percent decrease from the State's 2020 population of 20,104,710.[348]

The State is divided into 62 counties, 11 metropolitan statistical areas (MSAs), and five combined statistical areas (CSAs). Approximately 43.1 percent of the State's population resides within New York City with a 2022 population of approximately 8.6 million people; New York City is also the most populous metropolitan area in the U.S.[349]

Population levels and density vary substantially across the State. The five counties within New York City – Bronx, Kings, New York, Queens, and Richmond – are home to approximately 8.5 million residents and feature a population density of 28,154 per square mile. By comparison, the remainder of the State contains 11.3 million residents at a density of 243 per square mile.[350] **Figure 3-7** illustrates the relative population densities across the State. Population density outside of the New York Metropolitan area and other more populous cities exhibits an inverse relationship; as distance to the urban centers increases, population densities are considerably lower and development less intense, attributes reflecting communities more rural in nature.

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[344] *Ibid.*

[345] NYC Environmental Protection. A Guide to New York City's Noise Code. Accessed on October 29, 2024 at: https://www.nyc.gov/assets/dep/downloads/pdf/air/noise/noise-code-guide-summary.pdf.

[346] New York State Comptroller. Noise in New York City Neighborhoods. Accessed on October 29, 2024 at: https://www.osc.ny.gov/files/reports/special-topics/pdf/health-noise-in-nyc-2018.pdf.

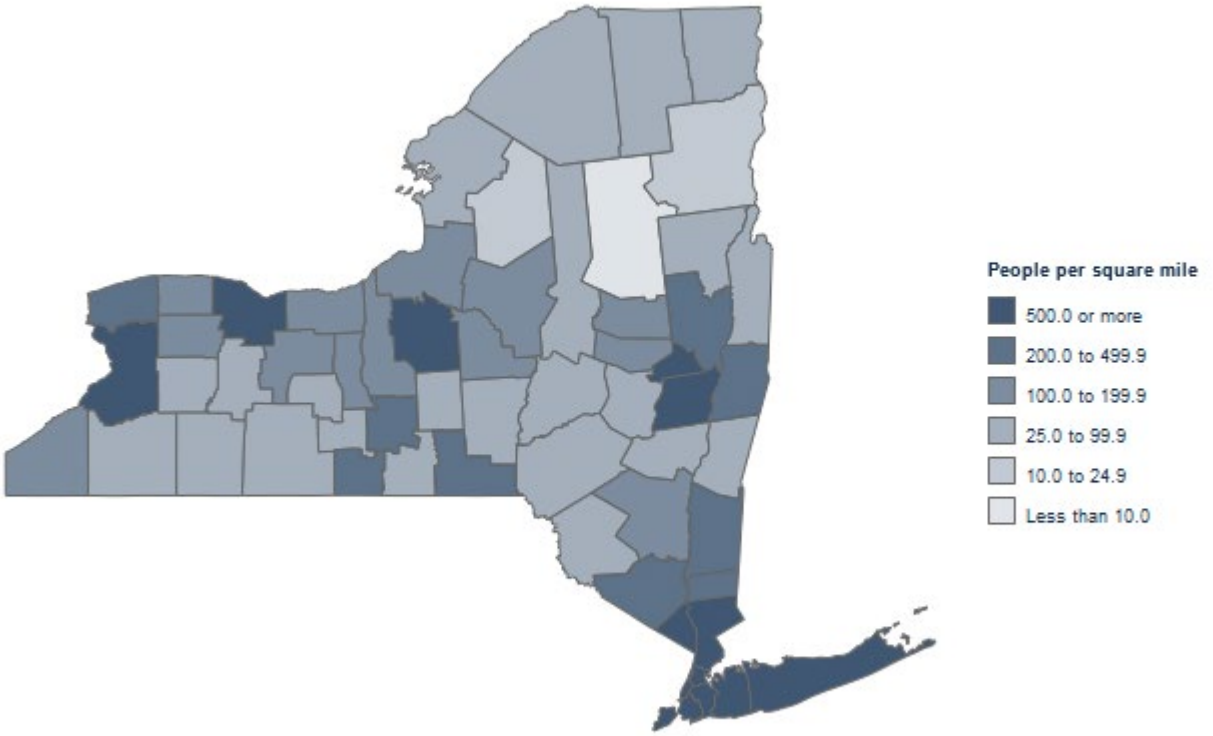
[347] *Ibid.*

[348] U.S. Census Bureau. State Population Totals and Components of Change: 2020-2023. Accessed on October 24, 2024 at: https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html.

[349] U.S. Census Bureau. 2022 American Community Survey 5-Year Estimates. Accessed on October 24, 2024 at: https://data.census.gov/table/ACSDP5Y2022.DP05?q=new%20york%20population&g=160XX00US3651000&d=ACS%205-Year%20Estimates%20Data%20Profiles&moe=false.

[350] New York State Department of Health. Vital Statistics of New York State 2021. Accessed on October 24, 2024 at: https://health.ny.gov/statistics/vital_statistics/2021/table02.htm#1.

Figure 3-7. New York State Population Density by County[351]



The state saw an overall increase in population between 2016 and 2021. Much of the population growth over those five years occurred in counties outside New York City. Population in four of the five New York City counties decreased in 2021 compared to 2016, whereas 27 of the 57 other counties experienced growth.[352,353]

3.10.2 Community Types

While community character is often thought to be relatively constant, it is always evolving due to shifting demographics, changes in the local and regional economy, and the passage of time. Regardless of size, development projects have the potential to affect how community character is perceived over both the short and long term. Although often difficult for residents or visitors to define, elements of community character can be highly influential in individuals' decisions to migrate, start a business, or travel to a given location. These elements can work in either positive or negative ways, either attracting or deterring residents, businesses, or visitors. **Table 3-7** summarizes the seven most common community types in the State.

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[351] U.S. Census 2020. NEW YORK: 2020 Census. Accessed on October 24, 2024 at: https://www.census.gov/library/stories/state-by-state/new-york-population-change-between-census-decade.html.

[352] New York State Department of Health. Vital Statistics of New York State 2021. Accessed on October 24, 2024 at: https://health.ny.gov/statistics/vital_statistics/2021/table02.htm#1.

[353] New York State Department of Health. Vital Statistics of New York State 2016. Accessed on October 24, 2024 at: https://health.ny.gov/statistics/vital_statistics/2016/table02.htm.

Table 3-7. Summary Of New York Community Types[354]

Community Type	Community Type Description
Rural Agricultural	The dominant land use in this community type is agriculture, and farm structures/equipment, livestock, and open fields are significant components of this landscape. Rural residences are typically scattered along a network of country roads. The topography in this setting will vary from hilly to flat, with a mix of crops and pastureland, woodlots, and hedgerows.
Rural Hamlet	The dominant feature in this community type is a cluster of residential structures in a largely rural setting. These areas may have a small commercial center that is usually located at an intersection of two rural roadways. Historic structures of varying significance are often present.
Village	These communities typically consist of a concentration of residential structures with a commercial business core. Historic structures and/or historic districts are often present. The structures may be of a vernacular material or style but typically include a mix of new and old architecture. Vegetation consists of large street trees, landscaped yards, and parks. The streets are often organized in a traditional grid pattern, and the more modern commercial and industrial facilities are typically located on the village periphery.
Suburban	Suburban residential areas consist of mostly residential structures along existing road frontage, as well as residential subdivisions with curvilinear roads and cul-de-sacs. These moderate- to high-density residential developments include larger yards and relatively modern homes of varying architectural styles and materials. Commercial portions of suburbs generally consist of strip development along a highway, including retail stores, automobile dealers, shopping centers, malls, and office- or light-industrial complexes; residential uses are limited. Suburban commercial character is typically dominated by highways, buildings, automobiles, and pavement (roads and parking lots). This type of setting usually surrounds a village or urban area; the surrounding landscape can vary from suburban residential, to farmland, to forested hills.
Urban	Urban residential settings are typically dominated by two- to four-story masonry apartment blocks and single family and multiple family homes, although some urban residential areas (e.g., portions of New York City) feature structures much larger than this. The streets are generally organized in a grid pattern and lined by narrow sidewalks and street trees. Urban commercial areas generally feature buildings that are at least two to four stories in height, with retail storefronts along the sidewalks and upper floors that are used as offices and apartments. Urban downtowns typically occur in the center of a city and are characterized by high-rise buildings and gridded street patterns. Both urban commercial and downtown areas usually feature gridded street patterns, which are busy with traffic, and frequently accommodate on-street parking. In general, views along urban streets are framed or screened by adjacent buildings, and vegetation is typically limited to street trees, planters, pocket parks, or larger public parks.
Industrial	Industrial areas are dominated by an often haphazard mix of buildings and structures associated with manufacturing, warehousing, utility, and transportation-related activities. An industrial setting often occurs along the outskirts of urban and village areas. The topography is generally flat, and vegetation is limited or nonexistent. Pedestrian activity is generally insignificant, as most activity typically occurs within the industrial facilities in such areas, although some industrial settings (typically older manufacturing districts) feature limited residential uses that may contribute a degree of community character.

[354] Table source from Chapter 4.14 of the Indian Point Contingency Plan Draft Generic Environmental Impact Statement. DPS and Ecology and Environment Inc. Indian Point Contingency Plan Final Generic Environmental Impact Statement. Accessed on October 31, 2024 at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B1CFCC090-1E99-4A8C-BC0C-56764C8985AD%7D.

Community Type	Community Type Description
Developed Shoreline	Along the State's coastlines (e.g., Long Island Sound, New York Harbor, and the Hudson River), open water is the dominant feature but is frequently interrupted by docks, piers, and/or boats. The shoreline may include natural beach or may be bulkheaded or otherwise structurally reinforced. A developed coastline will include ports, marinas, and shorefront commercial, residential, and recreational facilities. Along lakeshores other than those of the Great Lakes, the dominant natural feature is water, with surrounding hills and mountains typically in the background. However, the natural shoreline in these settings is interrupted by man-made features such as seasonal homes/camps, boathouses, and docks. The foreground that frames the water views includes both man-made and natural features.

3.11 Transportation

A broad network of ground, rail, and air transportation networks serves New York residents, businesses, and industry. These networks provide for short- and long-range travel into and within the state, and for transport of goods and services.

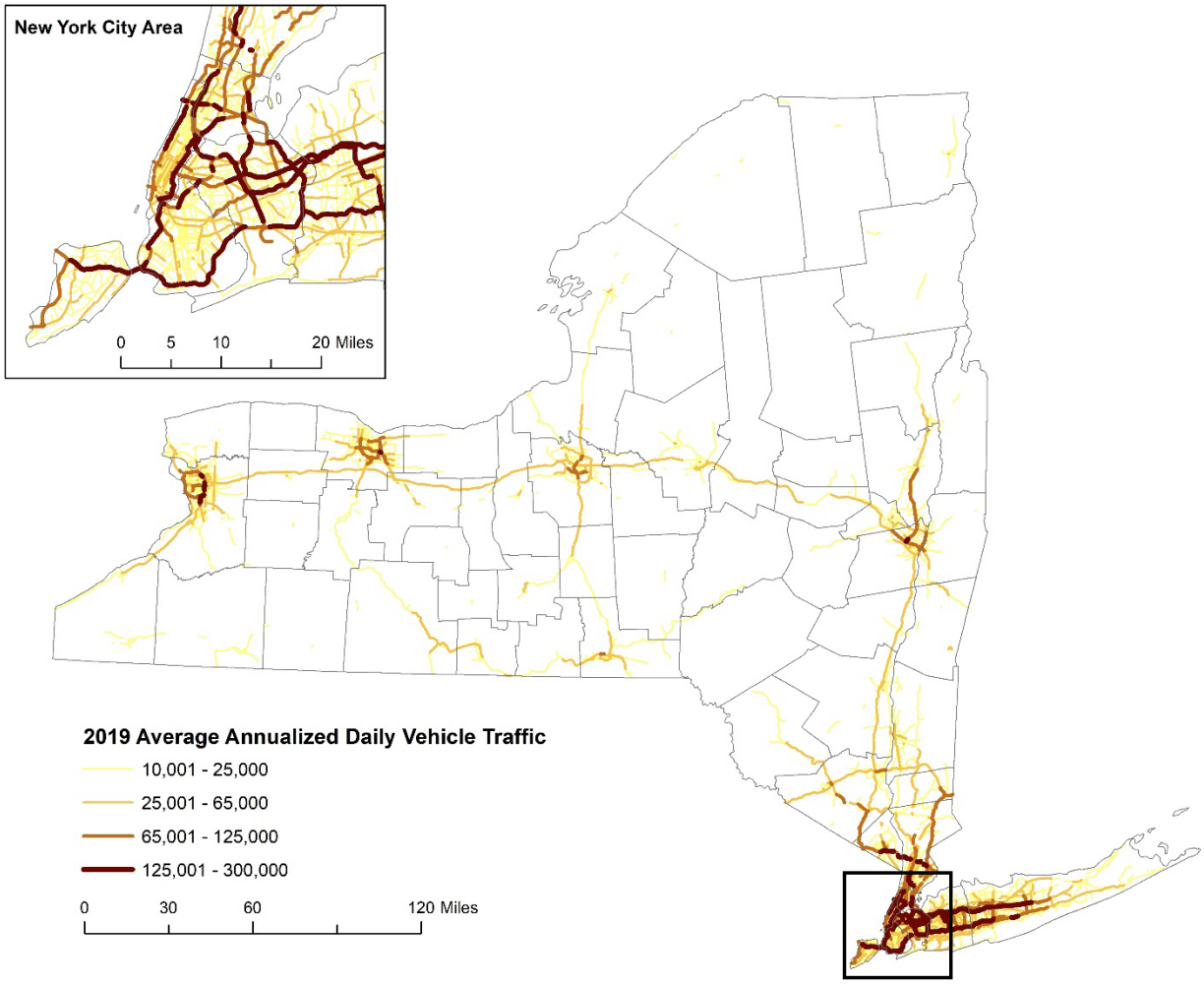
3.11.1 Roads and Highways

New York's primary transportation network consists of the existing system of interstate highways, urban expressways, rural highways, and local streets. Ownership of the state's roads, highways, and bridges is a patchwork of federal, state, county, local, and private ownership. The New York State Thruway is maintained by the New York State Thruway Authority, whereas the remaining federal and state highways are under the jurisdiction of the DOT. While counties and municipalities are responsible for local roads and bridges, federal funds from the Federal Highway Administration (FHWA) are frequently relied upon for periodic repairs and routine maintenance. The state's inventory of bridges includes a number of state and local bridges that currently require rehabilitation or replacement due to age and higher traffic loads in excess of the bridges' constructed capacity.[355]

Vehicular traffic between New York City and the rest of the state is a major area of focus. The Hudson Valley corridor, which funnels traffic to New York City, has a concentration of highways and parkways, including New York State Routes 9 and 9A and several limited-access highways and parkways, including the mainline of the New York State Thruway (I-87) which crosses the Hudson River at the Gov. Mario M. Cuomo Bridge and continues to I-278 in the Bronx, the Sawmill River Parkway, the Bronx River Parkway, the Hutchinson River Parkway (I-678), the Taconic Parkway, and I-95. Highway capacity in these areas is generally insufficient, adversely affecting vehicular traffic in the southeastern part of the state. Insufficient highway capacity is further exacerbated by the State's ongoing efforts to repair, reconstruct, and maintain its aging roads and highways; the capacity for existing highways to bear extra loads for construction vehicles or fuel deliveries is varied and, in some areas, limited. **Figure 3-8** presents the 2019 average annualized daily vehicle traffic volumes for the state as a whole as well as a subset focused on the Greater New York City Area.

[355] American Road and Transportation Builders Association. National Bridge Inventory: New York. Accessed on October 31, 2024 at: https://artbabridgereport.org/exports/ARTBA%202024%20Bridge%20Report%20-%20New%20York.pdf

Figure 3-8. New York State Traffic Volumes with Focus on New York City[356]



3.11.2 Transit, Air and Rail Services

The Metropolitan Transportation Authority (MTA) is the largest transportation network in North America. The MTA owns and operates New York City's public transit network, including the subways, buses, and the Metro-North and Long Island commuter railroads. The MTA also maintains most of the bridges in and out of New York City. Across its network, MTA serves a population of more than 15.3 million people who travel to, from, and through New York City, Long Island, and the southeastern portions of the state.[357] The MTA estimates that its subways and buses provided 1.6 billion trips in 2023.[358] MTA bridges and tunnels carried a record 336 million vehicles in 2023 – more than any bridge and tunnel authority in the nation.[359]

[356] NYS GIS Clearinghouse. Traffic Monitoring, March 22, 2023. Accessed on October 31, 2024 at: https://data.gis.ny.gov/maps/d2eacb538cc14f0a94492868baf7fc8f/about.

[357] New York Metropolitan Transportation Authority. About the MTA. Accessed on October 24, 2024 at: https://new.mta.info/about.

[358] New York Metropolitan Transportation Authority. Subway and bus ridership for 2023. Accessed on October 24, 2024 at: https://new.mta.info/agency/new-york-city-transit/subway-bus-ridership-2023.

[359] New York Metropolitan Transportation Authority. MTA Bridges and Tunnels. Accessed on October 24, 2024 at: https://new.mta.info/agency/bridges-and-tunnels.

Established in 1921, the Port Authority of New York and New Jersey (Port Authority) operates a number of facilities and transportation systems that serve the New York and adjacent New Jersey area, including commuter rail service to and from Manhattan and New Jersey, marine terminals and ports, six tunnels and bridges, and the Port Authority Bus Terminal in Manhattan.[360]

New York State also maintains an extensive system of rail lines for passengers and freight. Amtrak is the sole provider of intercity rail passenger service in the state, providing passenger service over rail lines owned by freight railroads. Amtrak links downstate with upstate cities, including Albany, Utica, Syracuse, Rochester, Buffalo, and many other intermediate points. The owners and operators of the State's freight corridors include CSX Transportation, Canadian Pacific Railway, Canadian National Railway, and Norfolk Southern Railway.[361]

The state's air transportation system is concentrated upon the two major New York City-based airports, John F. Kennedy International Airport (JFK) and LaGuardia Airport. Newark Liberty International Airport in New Jersey also serves as a popular point of entry and departure for New York residents and visitors. The Port Authority operates all three airports. Together they rank in the top 20 nationally for total enplanements.[362] JFK handles the most international traffic of any airport in the country and is one of the world's leading air cargo centers.[363] In 2023 the three major New York City area airports saw more than 1.2 million takeoffs and landings across cargo and passenger travel. JFK had the most, with 481,126, or 38 percent of activity.[364]

The state also has international airports in Buffalo, Albany, Rochester, and Syracuse, which each had more than one million enplanements in 2023. In total, the U.S. Federal Aviation Authority (FAA) lists 18 active commercial service airports across the state.[365]

3.12 Socioeconomics and Environmental Justice

The proposed action may impact multiple socioeconomic indicators, including employment levels, housing requirements, and municipal revenues. Given that transmission lines are present throughout the state, including areas where disadvantaged communities are present, this GEIS considers both broad potential socioeconomic impacts and environmental justice concerns.

3.12.1 General Demographics

New York City's long history as a principal point of entry into the U.S. serves as a source of ethnic and cultural diversity unique to the state. The U.S. Census estimates that as of 2023 68.5 percent of the state's population is White, 17.7 percent is Black or African American, and 9.7 percent is Asian. American Indians represent about one percent of the population, and Pacific Islanders less than one percent. In addition, approximately 23 percent

[360] The Port Authority of New York and New Jersey. About the Port Authority. Accessed on October 24, 2024 at: https://www.panynj.gov/port-authority/en/about.html.

[361] NYDOT. New York State Freight Transportation Plan August 2019. Accessed on October 24, 2024 at: https://www.dot.ny.gov/portal/page/portal/content/delivery/Main-Projects/projects/P11618881-Home/P11618881-repository/NYS%20Freight%20Plan%20September_2019.pdf.

[362] FAA. Final CY23 Enplanements at Commercial Service Airports. Accessed on October 28, 2024 at: https://www.faa.gov/sites/faa.gov/files/2024-10/cy23-commercial-service-enplanements.pdf.

[363] NYDOL. The Air Transportation Industry in New York State. Accessed on October 28, 2024 at: https://dol.ny.gov/system/files/documents/2021/03/the-air-transportation-industry-in-new-york-state.pdf.

[364] Port Authority New York New Jersey. Airport Traffic Report 2023. Accessed on October 28, 2024 at: https://www.panynj.gov/content/dam/airports/statistics/statistics-general-info/annual-atr/ATR_2023.pdf.

[365] FAA. Final CY23 Enplanements at Commercial Service Airports. Accessed on October 28, 2024 at: https://www.faa.gov/sites/faa.gov/files/2024-10/cy23-commercial-service-enplanements.pdf.

of the population is foreign-born. Twenty percent of all state residents are under the age of 18, and 19 percent are 65 years or older. The average household size throughout the state is 2.55 persons.[366]

3.12.2 Employment Characteristics

In the State, approximately 9.9 million people were employed in non-farm positions in September 2024. This represents a 1.4 percent increase compared to September 2023. According to the New York State Department of Labor, total private sector jobs (including construction) increased by 115,800 during the same period, equivalent to a year-over-year growth rate of 1.4 percent. The majority of the private sector job growth occurred in the downstate area, which includes New York City. New York City experienced job growth at a rate of 1.9 percent, while in the upstate region, private sector jobs grew by 0.9 percent over the past year. Some upstate counties experienced job decline, including Steuben County, Greene County, and Delaware County.[367]

3.12.3 Income and Wage Characteristics

The median family income in the State in 2024 is $105,200. In 2024, the median family income in non-metro areas is $83,500.[368] Counties with the highest median family income include Nassau County ($156,200), Rockland County ($133,400), and Albany County ($117,800). Rockland County has the highest median family income in upstate New York.[369] Counties with the lowest median family incomes in 2024 include Chautauqua County ($74,500), Cattaraugus County ($73,900), and Jefferson County ($73,100).[370]

Table 3-8 presents key economic characteristics for downstate New York.

[366] U.S. Census Bureau 2023. Quick Facts: New York. Accessed on October 24, 2024 at: https://www.census.gov/quickfacts/fact/table/NY/PST045223.

[367] New York State Department of Labor. Current Employment Statistics. Accessed on October 24, 2024 at: https://dol.ny.gov/current-employment-statistics-0.

[368] NYHCR. AHC Income Limits Chart. Accessed on October 24, 2024 at: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://hcr.ny.gov/ahc-income-limits&ved=2ahUKEwjD4fqz4aeJAxW_mYkEHXAWN3YQFnoECCkQAQ&usg=AOvVaw3xif1uynN0ANm_4Z_HBSZm.

[369] Given GEIS definition of upstate and downstate counties.

[370] *Ibid.*

Table 3-8. Select Income and Wage Characteristics of Downstate New York State (2018-2022)

Metric	Downstate New York Counties[371]
Households	4,616,001[372]
Homeownership rate	45.5%[373]
Median home value	$743,974[374]
Per capita income ($2022)	$34,103[375]
Median household income	$92,601[376]
Persons below poverty level	13.9%[377]

3.12.4 Housing Characteristics

In 2022, the estimated housing vacancy rate in the state was 9.4 percent, a decrease from 10.9 percent in 2021.[378] In 2022, 46.8 percent of housing units were single unit residences, while 26.2 percent of housing units were a part of structures containing two to 19 housing units, and 24.8 percent of housing units were a part of structures containing 20 or more housing units. Mobile homes, boats, RVs and other similar residences account for 2.1 percent of all housing units.[379] In New York City, the 2023 vacancy rate was 1.41 percent; while this number varied by borough, from a low of 0.82 percent in the Bronx to a high of 2.33 percent in Manhattan, overall, the city's vacancy rates were the lowest in the state.[380]

The 2022 American Community Survey (ACS) estimated that 42.6 percent of renters in the State paid gross rent costs totaling 35.0 percent or more of household income.[381] In 2023, of 2,324,00 total rental units in New York City, approximately 1.2 million units (or 52 percent) were rent regulated.[382]

[371] Downstate New York counties include Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, and Westchester. This definition differs slightly from that given in section 3.1.2, as a small portion of Westchester County falls within upstate NYCA Load Zone G.

[372] American Community Survey. 5-Year Estimates Selected Social Characteristics 2022. Accessed on October 24, 2024 at: https://data.census.gov/table/ACSDP5Y2022.DP02.

[373] American Community Survey. 5-Year Estimates Tenure 2022. Accessed on October 24, 2024 at: https://data.census.gov/table/ACSDT5Y2022.B25003.

[374] American Community Survey. 5-Year Estimates Selected Housing Characteristics 2022. Accessed on October 24, 2024 at: https://data.census.gov/table/ACSDP5Y2022.DP04.

[375] American Community Survey. 5-Year Estimates Demographic and Housing 2022. Accessed on October 25, 2024 at: https://data.census.gov/table/ACSDP5Y2022.DP05; American Community Survey. 5-Year Estimates Selected Economic Characteristics 2022. Accessed on October 25, 2024 at: https://data.census.gov/table/ACSDP5Y2022.DP03.

[376] ACS 2022 5-Year Selected Economic Characteristics and ACS 2022 5-Year Selected Social Characteristics

[377] ACS 2022 5-Year Selected Economic Characteristics and ACS 2022 5-Year Demographic and Housing Estimates

[378] ACS 2022 5-Year Selected Housing Characteristics.

[379] *Ibid.*

[380] New York City Rent Guidelines Board. 2024 Income and Affordability Study. Accessed on October 28, 2024 at: https://rentguidelinesboard.cityofnewyork.us/wp-content/uploads/2024/04/2024-IA-Study.pdf.

[381] ACS 2022 5-Year Selected Housing Characteristics.

[382] New York City Rent Guidelines Board. 2024 Income and Affordability Study. Accessed on October 28, 2024 at: https://rentguidelinesboard.cityofnewyork.us/wp-content/uploads/2024/04/2024-IA-Study.pdf.

3.12.5 Municipal Revenue

Real estate property taxes (RPT) are the primary source of revenue for the majority of cities, towns, and villages in the state. The RPT is levied in more than 4,700 taxing jurisdictions in the state, calculated based on the value of residential and non-residential real properties, with certain exceptions. Reliance on the RPT varies by type of government. In fiscal year 2022, counties across the State received 20.9 percent of their revenue from the RPT, while RPT accounted for an average of 23.2 percent of total revenue for cities, 48.3 percent of total revenue for towns, 45.6 percent of revenue for villages, and 51.2 percent of revenue for school districts. Overall, on average across all local governments, RPT accounted for 40 percent of total revenues.[383]

In addition to RPT, New York City is unique in its authority to levy several additional taxes, including personal and business income taxes. The City of Yonkers is also authorized to levy an individual income tax. Certain other local governments, including cities, counties, and school districts, are authorized to impose sales/use taxes, hotels and motel taxes, real estate transfer taxes, mortgage recording taxes, and utility taxes.

3.12.6 Environmental Justice and Disadvantaged Communities

The EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice efforts focus on improving the environment in minority and low-income communities, and on addressing disproportionate adverse environmental impacts experienced by those communities.

New York State addresses issues of environmental disparity through NYSDEC's environmental justice regulations and policies, and through consideration of Disadvantaged Communities (DACs) as defined by the Climate Justice Working Group, established pursuant to the CLCPA.

NYSDEC regulations at 6 NYCRR part 487 establish a regulatory framework for an analysis of environmental justice issues associated with approving siting of major electric generating facilities by the New York State Board on Electric Generation and the Environment pursuant to Article 10 of the Public Service Law.[384] For matters overseen by the NYSDEC, including the NYSDEC's environmental permit review process and NYSDEC's application of the SEQRA, NYSDEC Commissioner Policy 29 on Environmental Justice and Permitting (CP-29) provides guidance to assist agency staff in incorporating environmental justice considerations into their processes. CP-29 defines potential environmental justice areas as U.S. Census block groups, which are areas containing between 250 to 500 households, that, as reported in the 2000 census, had populations that met or exceeded at least one of the following statistical thresholds:

1. At least 52.4 percent of the population in an urban area reporting themselves to be members of minority groups; or

2. At least 26.3 percent of the population in a rural area reporting themselves to be members of minority groups; or

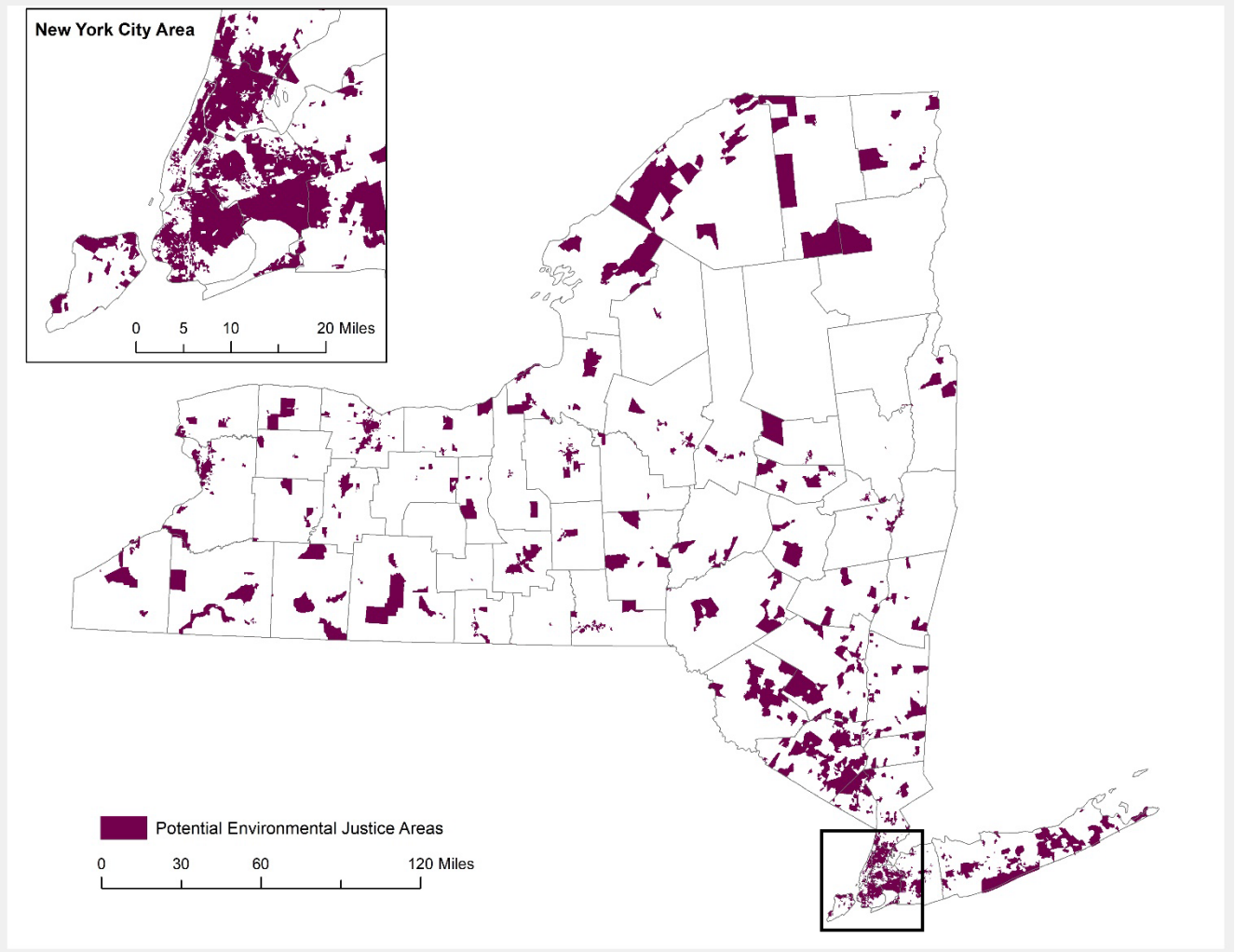
[383] Office of the NYS Comptroller, Division of Local Government and School Accountability. Annual Report on Local Governments for Fiscal Year End 2022. Accessed on October 28, 2024 at: https://www.osc.ny.gov/files/local-government/publications/pdf/fye2022-annualreport.pdf.

[384] NYSDEC. EJ Related Policy And Regulations. Accessed on October 28, 2024 at: https://dec.ny.gov/get-involved/environmental-justice/related-policy-regulations.

3. At least 22.82 percent of the population in an urban or rural area with household incomes below the federal poverty level.[385]

Since the release of CP-29, NYSDEC has updated the statistical thresholds for use with more current data. As shown in **Figure 3-9,** based on 2014-2018 ACS data, Potential Environmental Justice Areas (PEJAs) occur throughout the State, with an area of concentration in New York City.

Figure 3-9. NYSDEC Defined Potential Environmental Justice Areas in New York State with Focus on New York City[386]



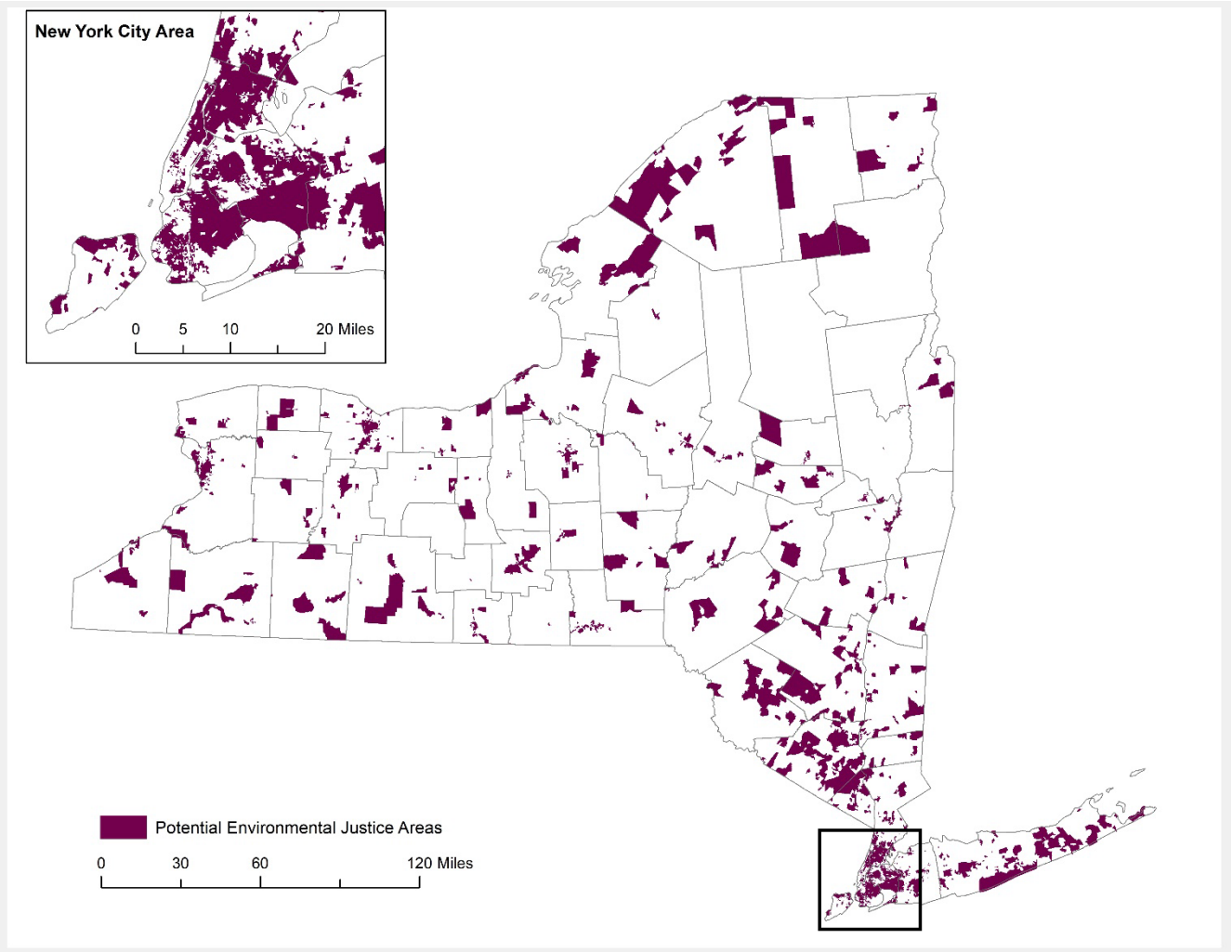
DACs have slightly different identifying characteristics than PEJAs. (see **Figure 3-10**). The CLCPA's Climate Justice Working Group (CJWG) defined 45 indicators which it used to identify the 35 percent of New York State census tracts that most fully meet their definition of DACs. The criteria include multiple indicators that represent the environmental burdens or climate change risks within a community, or population characteristics

[385] NYSDEC. Maps & Geospatial Information System (GIS) Tools For Environmental Justice. Accessed on October 28, 2024 at: https://dec.ny.gov/get-involved/environmental-justice/gis-tools.

[386] *Ibid.*

and health vulnerabilities that can contribute to more severe adverse effects of climate change.[387] **Table 3-9** summarizes the distribution of DACs across the State.

Figure 3-10. Disadvantaged Communities in New York State[388]



[387] NYSDEC & NYSERDA. New York State's Disadvantaged Communities Criteria. Accessed on October 31, 2024. Available at: https://climate.ny.gov/-/media/Project/Climate/Files/Disadvantaged-Communities-Criteria/LMI-daccriteria-fs-1-v3_acc.pdf..

[388] NYS Climate Act. Disadvantaged Communities Criteria. Accessed on October 31, 2024 at: https://climate.ny.gov/Resources/Disadvantaged-Communities-Criteria.

Table 3-9. Percentage of Census Tracts in Each Region Designated a DAC[389]

Region	% of Tracts with Regions Identified as DACs
New York City	44%
Mid-Hudson	42%
Finger Lakes	35%
Central NY	35%
Western NY	34%
Mohawk Valley	26%
Southern Tier	22%
Capital Region	21%
North Country	14%
Long Island	14%
Statewide Total	**35%**

Thirty-five (35) percent of the benefits from the State's CLCPA investments must be directed to DACs. State agencies must also consider impacts on DACs in their decision-making. DAC indicators address two main categories: environmental burden, and population characteristics and health vulnerabilities. Environmental burdens are shared between (i) land use and proximity to facilities associated with historical discrimination or disinvestment, (ii) climate change risks, and (iii) potential pollution exposures. Historical discrimination and disinvestment metrics measure individuals' proximity to sites and facilities known for their environmental harm, such as landfills, energy plants, waste combustors, and extractive industries. Climate change risks are based on exposure to extreme heat, coastal and inland flooding, and other risks, while pollution exposure measures include vehicle emissions, particular matter, and wastewater discharge. Population characteristics and health vulnerabilities cover income, race and ethnicity, health outcomes and sensitivities, and housing mobility and communication.[390]

[389] NYSDEC & NYSERDA, New York State's Disadvantaged Communities Criteria. Accessed on October 31, 2024. Available at: https://climate.ny.gov/Resources/Disadvantaged-Communities-Criteria.

[390] *Ibid*.

CHAPTER 4 | Alternatives Considered

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(v) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter evaluates and compares reasonable alternatives to the proposed action. This chapter defines the baseline or "no action" scenario, in which transmission siting continues under the present New York Public Service Law (PSL) article VII (Article VII) regulations at 16 NYCRR subchapter G: Certificates of Environmental Compatibility and Public Need. It then addresses alternatives to the action and completes the baseline characterization by explaining the differences between the current PSL Article VII, Siting of Major Utility Transmission Facilities procedures, and the approach established by the RAPID Act in Public Service Law article VIII (Article VIII). Given that the proposed action is a response to a legislative mandate, there are no other reasonable alternatives to evaluate.

Chapter 5 describes the impacts of the proposed action and the "no action" scenario. **Chapter 6** discusses the measures available to avoid or minimize, to the maximum extent practicable, potentially adverse environmental impacts that may result from the proposed action.

4.1 Reasonable Alternatives

There are no reasonable alternatives other than the "no action" scenario to be evaluated per 617.9(b) because the proposed action is the result of a legislative mandate.

4.2 Baseline and No Action Scenario

The "no action alternative" requires a discussion of the adverse or beneficial changes that are likely to occur in the absence of the proposed action. Thus, defining the relevant baseline conditions is necessary to provide a point of reference to which the environmental, economic, and social impacts of the proposed action can be compared. This baseline should represent the most likely state of resources, activities, markets, and behaviors that would exist absent implementation of the proposed action; in this case, the promulgation of the new regulations implementing Article VIII.

Here, that baseline would be the siting of transmission facilities under Article VII. The RAPID Act expressly preserves the Commission's existing transmission licensing authorities until Article VIII regulations become effective. Because of this, if issuance of the new regulations were delayed or indefinitely postponed, upgrades and extensions of the transmission system would continue to be reviewed under the Article VII process. The State's future electric system needs, including basic infrastructure repairs, utility capital investment plans, and serving the State's climate policies, will remain the same regardless of which regulatory scheme were in effect. The anticipated difference between the action and the "no action" alternative would be the pace of permit approvals for the same portfolio of transmission projects. It is also conceivable that an accelerated permit process might lead to a higher rate of transmission construction; however, it is not possible to evaluate that potential impact in any meaningful way due to the multiple factors that affect utility construction schedules. What can be said is that, in promulgating the RAPID Act regulations, ORES is taking the steps within its mandate to support the expeditious achievement of the State's near- and long-term climate goals while continuing to ensure the protection of the environment and consideration of all pertinent social, economic, and environmental factors in the decision to permit such projects.

4.2.1 PSL Article VII, Siting of Major Utility Transmission Facilities

PSL Article VII sets forth a review process for the consideration of any application to construct and operate a major utility transmission facility.[391] Article VII requires a full review of the need for and environmental impact of the siting, design, construction, and operation of major transmission facilities in New York.[392] With respect to electric facilities, the law defines "major utility transmission facilities" as transmission lines that have a design capacity of 100 kilovolts (kV) or more extending for at least 10 miles, or 125 kV and over extending a distance of one mile or more. Transmission lines that are underground in a city with a population in excess of 125,000 or are in connection with a hydroelectric facility that must be approved by the Federal Energy Regulatory Commission (FERC) are excluded.[393] Regulations for siting major electric transmission facilities are established through 16 NYCRR subpart 85-2, "Procedures with Respect to All Electric Transmission Lines and Fuel Gas Transmission Lines 10 or More Miles Long;"[394] subpart 85-3, "Procedures with Respect to Expedited Proceedings;" part 86, "General Exhibits;" and part 88, "Exhibits for Electric Transmission Filings."

The State Legislature enacted Article VII in 1970 to establish a single forum for reviewing the need for, and environmental impact of, certain major electric and gas transmission facilities. The law requires an applicant to apply to the Commission for a Certification of Environmental Compatibility and Public Need (CPCN) and meet Article VII requirements before constructing any major electric transmission facility. Under Article VII, the Public Service Commission (PSC or Commission) is the sole State-level permitting authority for major transmission facilities. No other State agency or municipality may require any approval, consent, permit, certificate, or other condition for the construction or operation of a major transmission facility.[395] As the sole permitting authority, the Commission is required to find that the facility as proposed conforms to all applicable State and local laws and regulations. The Commission may elect, however, not to apply any local law or ordinance it finds is unreasonably restrictive in view of existing technology, factors of cost or economics, or the needs of consumers.[396]

Prospective Article VII applicants are encouraged to consult informally with stakeholders early in the planning phase of a project.[397] The filing of an Article VII application must be accompanied by proof of notice sent to stakeholders such as local municipalities and residents located in the areas potentially impacted by a proposed facility. Once application materials are submitted and the application is determined to comply with the applicable legal requirements for filing, the application review begins. An application proceeding must be completed within one year of the completeness determination unless it qualifies for a nine-month expedited process. The proceeding may also extend for longer than one year if an applicant notices the application for settlement, in which case the decisional deadline is tolled for a commensurate period of time. Before the PSC makes a decision, and within 60 to 90 days of an application being deemed complete (i.e., compliant with applicable legal requirements for filing), public statement hearings must be held to allow for comments from the public. In contested proceedings, an Administrative Law Judge (ALJ) from the Office of Hearings and Alternative Dispute Resolution presides in case hearings, rules on procedural matters, and makes a recommendation to the PSC.[398] The Commission designates staff to represent the public interest in such

[391] This section adds to Section 2.5.3 (Modifications to the Transmission Siting Program) of Chapter 2.

[392] Public Service Law § 121.

[393] Public Service Law § 120.

[394] 16 NYCRR subchapter G.

[395] Public Service Law § 130.

[396] Public Service Law § 126(1)(g).

[397] New York Department of Public Service. 2024. Article VII Certification Review Process Guide. Accessed on November 13, 2024 at: https://dps.ny.gov/system/files/documents/2024/06/article-vii-certification-review-process-guide.pdf.

[398] *Ibid.*

proceedings.[399] The Commission makes the final decision on whether to grant a final siting permit for a transmission facility application.

Table 4-1 defines the existing rules and regulations that would apply absent the proposed action. This review of rules and regulations is not all-encompassing; rather, the table focuses on key elements of the current transmission siting process that characterize the "no action" alternative, including timelines, permitting authorities, and application requirements.

Table 4-1. Existing Rules and Regulations of the Major Electric Transmission Siting Process under PSL Article VII[400]

Requirement / Component	Description
Permitting Authority	The PSC makes the final decision regarding all siting applications and granting of a final siting certificate. State and local officials, agency representatives, municipalities, special interest and environmental groups, residents of communities or areas directly surrounding the proposed facility, and residents in other communities or areas that are adjacent to the proposed facility can participate as parties in the review process.
Limitations of Authorization	Other than the PSC, no state agency, municipality, or any agency may require any approval, consent, permit, certificate, or other condition for the construction or operation of a major transmission facility other than those provided by otherwise applicable state law for the protection of employees engaged in the construction and operation of such facility, and provided that such a municipality has received notice of the filing of the application.
Major Electric Transmission Facility	An electric transmission facility (including associated equipment) with a design capacity of (i) 125 kilovolts or more, extending a distance of one mile or more; or (ii) 100 kilovolts or more, but less than 125 kilovolts, extending a distance of 10 miles or more. A transmission facility does not include any electric transmission line located wholly underground in a city with a population in excess of 125,000, or a primary transmission line (as such term is used in the Federal Power Act [16 USC 791—a-828c]) approved by the Federal Energy Regulatory Commission in connection with a hydroelectric facility.

[399] Public Service Law § 124(2).

[400] Sources include Public Service Law §§ 120 to 130; 16 NYCRR 85-2; Article VII Certification Review Process Guide and Article VII Major Electric and Gas Transmission Facilities.

Requirement / Component	Description
Application Requirements[401]	An application for a certificate shall contain: "(a) the location of the site or right-of-way; "(b) a description of the transmission facility to be built thereon; "(c) a summary of any studies which have been made of the environmental impact of the project, and a description of such studies; "(d) a statement explaining the need for the facility; "(e) a description of any reasonable alternate location or locations for the proposed facility, a description of the comparative merits and detriments of each location submitted, and a statement of the reasons why the primary proposed location is best suited for the facility; and "(f) such other information as the applicant may consider relevant or the commission may by regulation require."[402]
Proof of Notice to Local Stakeholders	The filing of an application must be accompanied by proof of notice that a summary of the application was published in a local newspaper(s) or news outlet in all areas through which the facility is proposed to pass. Each municipality in which any portion of such facility is to be located must be sent a copy of the application. Each landowner of land on which any portion of such proposed facility is to be located must be noticed by first class mail.
Notice of Application	There is no timeline requirement for the PSC to determine whether an application is complete or incomplete.
Public Statement Hearing Timeline	The PSC is required to fix a date for commencing a public hearing on a filing for an electric transmission facility not less than 60 or more than 90 days after an application is complete (i.e., it complies with application filing requirements) (PSL § 122).
Hearing Phase	The Administrative Law Judge (ALJ) must set dates for and hold hearings (pre-hearing and public statement hearings) to discuss procedural matters and issues to be explored, and to receive statements of position or concern from local stakeholders affected by an applicant's proposal. When one or more issues are in controversy, a case may require formal evidentiary hearings, at which evidence and testimony are presented. If so, participation can include presenting written direct testimony, cross-examination of witnesses, and submission of written summaries (i.e., briefs) of the parties' positions and arguments at the close of the hearings. In a case where evidentiary hearings are held, the Department of Public Service's Office of Hearings and Alternative Dispute Resolution provides an ALJ to preside in the case. The ALJ, who is independent of staff and parties involved, conducts public statement and evidentiary hearings and rules on procedural matters. The ALJ makes a recommendation for the PSC's consideration. Trial staff is appointed by the Commission to represent the public interest during these proceedings.

[401] Refer to 16 NYCRR part 86 and part 88 for the full set of application requirements.

[402] Public Service Law § 122(1).

Requirement / Component	Description
Final Decision	An application proceeding must be completed within one year of the completeness determination unless it qualifies for a nine-month expedited process. The deadline may be extended up to an additional six months under certain circumstances, including if the applicant was unable to obtain necessary approvals and/or consents related to highway crossings or for other reasons deemed in the public interest. In addition, the PSC must follow the one-year decision requirement unless deadlines are waived by the applicant or if the applicant notices the application for settlement, in which case the timeframes established are tolled for an unlimited period until settlement discussions are suspended.
Local Law or Ordinance Waiver	The PSC may elect not to apply any local ordinance, law, resolution or other action, or any regulation issued thereunder or any local standard or requirement which would be otherwise applicable, if it finds that as applied to the proposed facility such is unreasonably restrictive in view of the existing technology, factors of cost or economics, or the needs of consumers.
Expedited Process / Existing Right-of-Way	An expedited process is available for major electric transmission facilities that fall under the following categories: (i) a transmission facility would be constructed within existing rights-of-way; (ii) the commission determines in consultation with the Department of Environmental Conservation that the proposed project would not result in any significant adverse environmental impacts considering current uses and conditions existing at the site; or (iii) would necessitate expanding the existing rights-of-way, but such expansion is only for the purpose of complying with law, regulations, or industry practices relating to electromagnetic fields. An expedited process requires the PSC to provide a final decision within nine months from the date of a determination of completeness of an application. Similar to the standard siting process, there is an exception for delays that result from the settlement process.
Article VII Settlements	Parties within the Article VII transmission siting process cases can resolve their concerns and issues through settlements in accordance with the Commission's Settlement regulations (16 NYCRR Section 3.9) and guidelines adopted in Case 90-M-0255.
Judicial Review	Any party aggrieved by any order issued on an application for a certificate may apply for a rehearing within 30 days after issuance of the order and thereafter obtain judicial review of such order in a proceeding. Such a proceeding shall be brought in the Appellate Division of the Supreme Court of the State in the judicial department embracing the county wherein the proposed facility is located.

Since 2019, there have been nine applications filed with the Commission for electric transmission facilities pursuant to Article VII of the PSL that received a certificate. The average time from the subject applications' compliance with PSL § 122 to certificate issuance was approximately 536 days, with the settlement process being a key factor in timing.

4.3 New PSL Article VIII

The RAPID Act repeals the former section 94-c of the Executive Law and the existing Article VII, and enacts a new Article VIII entitled "Siting of Renewable Energy and Electric Transmission."[403] The RAPID Act

[403] FY 2025 New York State Executive Budget 12673-01-4, Renewable Action Through Project Interconnection and Deployment ("RAPID") Act, 129-167.

consolidates and aligns the transmission siting process and the ORES generation siting process under former section 94-c of the Executive Law into the newly created Article VIII process.

Article VIII modifies the transmission siting process as compared to Article VII, with the goal of expediting transmission siting to facilitate achievement of the CLCPA goals.[404] The RAPID Act transfers jurisdiction of transmission siting from the PSC to ORES and renames ORES to be the "Office of Renewable Energy Siting and Electric Transmission" (remains "ORES" in the document). Additionally, the Act relocates ORES from the Department of State to the Department of Public Service (DPS). Article VIII requires ORES to enact standardized siting permit conditions to address the potential adverse impacts common to all projects with the intent of streamlining the approval process. Article VIII also authorizes ORES to impose site-specific siting permit conditions to address potential site-specific or project-specific impacts posed by a specific proposed project that are not addressed by the uniform standards and conditions.

Similar to Article VII, Article VIII consolidates the State-level final permitting authority for major electric transmission facilities (and major renewable energy facilities) solely within ORES, as opposed to spread across separate New York State departments and local municipalities. As the sole State-level permitting authority for major electric transmission facilities, ORES is required to ensure that a final siting permit complies with all applicable State and local laws and regulations. Similar to the Commission's authority under Article VII, in making a final siting permit determination, ORES may elect not to apply any local law or ordinance if it finds that it is unreasonably burdensome in view of the CLCPA targets, the environmental benefits of the facility and, in the case of a transmission facility, the public need for the project.

Article VIII establishes a two-step process for siting permit application review. First, siting permit applications are administratively reviewed by ORES technical permitting staff, culminating in the issuance of draft siting permit conditions for public comment and potential adjudicatory hearings before an ALJ. In contrast to the Article VII process, issuance of a draft permit for public comment begins the formal public involvement process intended to gain stakeholder feedback, and to focus the adjudicatory hearing, if one is held, on substantive and significant disputes regarding the application or draft siting permit. This replaces the Article VII process whereby the entire application review is conducted in the context of adjudicatory hearings or through settlement procedures.

Article VIII requires ORES to adhere to expedited timelines for permitting transmission facilities similar to requirements for permitting renewable energy facilities under the former section 94-c. The timelines include a maximum of 120 days within which ORES must determine whether an application is complete, a maximum 60 days to issue draft siting permit conditions for public comment, a minimum 60-day public comment period, and a maximum one year from application completeness to issue a final siting permit decision.

Finally, Article VIII contains provisions intended to foster and facilitate municipal and community engagement in the siting permit application review process. These include the requirement that siting permit applicants engage with impacted municipalities early in the application development process and provide proof of consultation before an application will be deemed complete.[405] It also provides local agency account funding to impacted municipalities and potential community intervenors to offset the costs associated with participating in public comment periods or hearings on an application.

Table 4-2 defines the elements of the major electric transmission facility siting process that are amended by the RAPID Act, focusing on the timeline of the siting process, the powers and functions of ORES, and the

[404] *Ibid.*

[405] *Ibid.*

mitigation of adverse environmental or social impacts. Additionally, the full scope of modifications will be finalized when ORES, in consultation with other State departments and authorities, establishes the rules and regulations to implement the new siting permit program and the set of uniform standards and conditions for the siting, design, construction, and operation of major electric transmission facilities subject to Article VIII.

The permitting process modifications in Article VIII reflect the scenario under which transmission siting is reformed and the process changes from the "no action" alternative. The amendments to the transmission siting process under Article VIII are primarily procedural and are intended to expedite the timeline of transmission permitting. The requirements applicable to permit applications and the factors that ORES must consider in its review are not substantively different from the Article VII process, with the exception of the requirement for additional proof of consultation with local authorities and provisions related to farmland protection. Based on this, the proposed action to reform the transmission siting process as required under the RAPID Act will not change the nature of socioeconomic and environmental impacts, including benefits, but may accelerate the timing of such impacts if more projects are approved in shorter timeframes.

Table 4-2. Modifications to the Major Electric Transmission Siting Process Mandated by PSL Article VIII[406]

Requirement / Component	Description
Permitting Authority	ORES, through the ORES Executive Director, has full authority to grant final siting permits for both major renewable energy facilities and major electric transmission facilities. This includes all functions, powers, duties, and obligations related to major renewable energy siting granted to ORES under former Executive Law § 94-c, as well as the new additional functions, powers, duties, and obligations related to major electric transmission siting set forth in Article VIII. ORES is established as the single State entity to coordinate timely review of transmission projects to meet the State's renewable energy goals and ensure the reliability of the electric transmission system, while also ensuring the protection of the environment and consideration of all pertinent social, economic, and environmental factors in the decision to permit such projects.
Limitation of Authorization	No other state agency (other than ORES), department, or authority, or any municipality or political subdivision may, except as expressly authorized under Article VIII or the rules and regulations promulgated under this article, require any approval, consent, permit, certificate, contract, agreement, or other condition for the development, design, construction, operation, or decommissioning of a major electric transmission facility, provided local municipalities and political subdivisions have received notice of the filing of the application.
Uniform Standards and Conditions	The uniform standards and conditions established according to Article VIII should be designed to avoid or minimize, to the maximum extent practicable, any potential significant adverse environmental impacts related to the siting, design, construction, and operation of a major electric transmission facility that are common to such facilities.
Site-specific Conditions	In its review of an application for a major electric transmission facility siting permit, ORES, in consultation with the New York State Department of Environmental Conservation (NYSDEC), shall identify those adverse site-specific environmental impacts, if any, that may be caused or contributed to by a specific proposed major electric transmission facility and are not addressed by the uniform standards and conditions. ORES shall draft, in consultation with DEC, site-specific major electric transmission facility siting permit terms and conditions for such impacts, including provisions for the avoidance or mitigation thereof, taking into account the CLCPA targets, the environmental benefits of, and public need for the proposed major electric transmission facility.

[406] *Ibid*.

Requirement / Component	Description
Adverse Impacts Mitigation	If adverse environmental impacts are not addressed by uniform standards and conditions and site-specific permit conditions proposed by ORES, and ORES determines that mitigation of such impacts may be achieved by off-site mitigation, ORES may require payment of a fee by the applicant to achieve such off-site mitigation. This includes mitigation of impacts to endangered or threatened species; off-site mitigation is acceptable if it achieves a net conservation benefit for the species.
Existing Right-of-Way	In its regulations, ORES may exempt a major electric transmission facility that would be constructed substantially within existing rights-of-way from certain requirements of Article VIII, provided that such relief is reasonable and does not impair any rights of municipalities established under the Article or limit requirements relating to public notice or the finding of public need.[407]
Proof of Consultation with Local Municipality or Subdivision	No application may be complete without proof of consultation related to procedural and substantive requirements of local law with the municipality or political subdivision where the project is proposed to be located, or an agency thereof, prior to submission of an application to ORES.
Municipal Statement of Local Law Compliance	The municipalities or political subdivisions affected by a proposed project must submit to ORES a statement whether the project is designed to be sited, constructed, and operated in compliance with applicable local laws and regulations. If a municipality or political subdivision submits a statement that a proposed project is not designed to be sited, constructed, and operated in compliance with applicable local laws and regulations, and ORES determines not to hold an adjudicatory hearing on the application, ORES shall hold a non-adjudicatory public hearing in or near one or more of the affected municipalities or political subdivisions.
Application Requirements / Reasonable Alternative Locations	In addition to addressing uniform standards and conditions, an application for a major electric transmission facility siting permit shall contain: "(i) the location of the site or right-of-way; "(ii) a description of the transmission facility to be built thereon; "(iii) a summary of any studies which have been made of the environmental impact of the project, and a description of such studies; "(iv) a statement explaining the public need for the facility; "(v) copies of any studies of the electrical performance and system impacts of the facility performed by the state grid operator pursuant to its tariff; "(vi) such other information as the applicant may consider relevant or ORES may by regulation require; and "(vii) a description of any reasonable alternative location or locations for the proposed facility, a description of the comparative merits and detriments of each location submitted, and a statement of the reasons why the primary proposed location is best suited for the facility."[408]
Notice of Complete Application	ORES shall within 120 days from receipt of an application of a major electric transmission facility determine whether the application is complete and notify the applicant of its determination.

[407] Projects within existing rights-of-way will still be required to obtain a final siting grant, but the projects will be exempt from some requirements in the process. The full extent of these exceptions is expected to be described in the rules and regulation that are to be established by ORES.

[408] Public Service Law § 143(2).

Requirement / Component	Description
Draft Permit / Public Comment Period	Sixty days after an application is deemed complete, ORES shall publish for public comment draft permit conditions prepared by ORES, with a minimum comment period of 60 days. The draft permit provides a forum for public involvement intended to gain stakeholder feedback and resolve significant disputes, as opposed to conducting this process through adjudicatory hearings or settlement procedures.
Adjudicatory Hearing	If public comments on a draft siting permit, including comments provided by a municipality, landowners, or members of the public, raise a substantive and significant issue as defined in the regulations that requires adjudication, ORES shall promptly fix a date for an adjudicatory hearing before an ALJ to hear arguments and consider evidence with respect thereto.
Final Decision	ORES shall make a final decision on a siting permit within one year from the date the application was deemed complete.
Automatic Grant	If a final siting permit decision has not been made by ORES within such time period, and unless ORES and the applicant have agreed to an extension, then such a siting permit shall be deemed to have been automatically granted for all purposes, and the draft permit, if any, issued by ORES constitutes the final siting permit. If any portion of a transmission facility is to be located on the land of a landowner for which the applicant lacks an existing right-of-way agreement and in which ORES has not made a public need determination, no such permit may be automatically granted.
Local Law or Ordinance Waiver	In making a final siting permit determination with respect to a major electric transmission facility, ORES may elect not to apply, in whole or in part, any local law or ordinance that would otherwise be applicable if ORES makes a finding that, as applied to the proposed facility, it is unreasonably burdensome in view of the CLCPA targets, the environmental benefits, and in the case of a transmission facility, the public need for the proposed project.
Settlement	Article VIII does not expressly provide for formal settlement procedures, other than authorizing ORES to conduct alternative dispute resolution proceedings. However, the current Article VIII regulations allow the parties to a siting permit application proceeding to settle any or all issues in the proceeding and thereby remove such issues from further consideration by the ALJ or Executive Director. Unlike Article VII, the one-year timeframe for final decision is not tolled pending settlement discussions.
Judicial Review	Any party aggrieved by the issuance or denial of a siting permit may seek judicial review by filing a petition within 90 days after issuance of a final decision by ORES. Such a proceeding shall be brought in the Third Department of the Appellate Division of the Supreme Court of the State of New York.
Agricultural Impacts / Farmland Protection Working Group	Major electric transmission facilities (and major renewable energy facilities) are to be designed, constructed, and operated in a manner that avoids, minimizes, or mitigates, to the maximum extent practicable, potential significant adverse impacts to land used in agricultural production, with additional consideration for land within an agricultural district or land that contains mineral soil groups 1-4 (i.e., soil that may best support crops). In addition, Article VIII continues the Farmland Protection Working Group originally established pursuant to 2021 amendments to former Executive Law § 94-c to recommend strategies to encourage and facilitate input from municipalities in the siting process and to develop recommendations that include approaches to recognize the value of viable agricultural land and methods to minimize adverse impacts to any such land resulting from the siting of major facilities.

CHAPTER 5 | Environmental Impacts of Proposed Action

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.10(a) implementing New York's State Environmental Quality Review Act (SEQRA), a generic EIS may be broader and more general than an EIS, but the fundamental requirement to evaluate the environmental impacts of an action remains. Specifically, this chapter evaluates the impacts that could arise from actions taken in response to the promulgation of rules and regulations necessary to implement the RAPID Act as codified in Public Service Law § 3-c and the new Public Service Law article VIII (Article VIII).

In considering the promulgation of rules and regulations to implement the RAPID Act, it is also necessary to assess its potential to directly or indirectly change other aspects of the environment. In particular, such changes include those that may not be the primary goal of the proposed action but nonetheless could result in significant and/or adverse impacts on the environment.

5.1 Framework for Evaluating the Environmental Impacts of the Proposed Action

The RAPID Act is expected to expedite the review and permitting of major electric transmission facilities in New York State, but will not, by itself, change the number or location of transmission projects that will be needed to meet the State's various goals. In other words, it is highly likely that the same transmission projects would be completed after implementation of the RAPID Act as would be completed under the Article VII regulatory regime. Most of the direct and indirect effects of the actual future projects would therefore be similar under the proposed action and the "no action" alternative. To the extent that the proposed action will generate incremental impacts on the environment relative to baseline conditions, such impacts are most likely to materialize as cumulative impacts (defined below).

The proposed action of promulgating rules and regulations does not include any direct approval of applications for the siting of major electric transmission facilities. Instead, the proposed action provides procedural and substantive requirements for applications for the siting of major electric transmission facilities and establishes uniform standards and conditions (USCs) applicable to siting permits issued by the Office of Renewable Energy Siting and Electric Transmission (ORES). The statute requires the regulations to ensure projects are constructed in a manner that avoids or minimizes, to the maximum extent practicable, significant adverse environmental and social impacts. Each application for a siting permit would undergo an individual, site-specific review by ORES in accordance with the procedural and substantive requirements of Article VIII and the proposed regulations with that objective. Where USCs do not cover a particular issue on a specific project, ORES is authorized to design measures and impose site-specific siting permit conditions to reduce such site-specific or project-specific impacts.

Given the nature of the proposed action, the evaluation of environmental impacts in this chapter is largely qualitative and applies to the entire State of New York, including coastal waters under the State's jurisdiction. A quantitative assessment of the potential environmental impacts of the proposed action would require, at a minimum, knowledge of the exact number and locations of new transmission facilities or future transmission system upgrades in the State, under both the proposed action and the "no action" alternative. Such a quantitative comparison would be overly speculative at this time.

Concerning the siting of major renewable energy generation and electric transmission facilities, the RAPID Act also mandates additional requirements for farmland protections. Recent changes to the Department of Environmental Conservation's (NYSDEC's) freshwater wetland regulatory program also necessitate

modification to ORES's regulatory program governing freshwater wetlands for both generation and transmission projects. Finally, ORES is revising its renewable energy generation regulations to incorporate process improvements based on the office's experience in implementing the former 19 NYCRR part 900, now 16 NYCRR part 1100. This GEIS also discusses the environmental impacts associated with these changes qualitatively. However, it should be noted that the changes necessitated by the new NYSDEC freshwater wetlands regulations are subject to a separate environmental review; the changes to ORES regulations necessitated by the NYSDEC regulatory program do not require additional consideration.

The qualitative assessment presented in this chapter utilizes a broad definition of environmental impacts including the full array of resource areas described in **Chapter 3.** Impacts will vary depending on the type of transmission line – overground, underground, or underwater – the construction technology, and the structures supporting transmission cables. **Chapter 2** describes transmission structures and construction techniques in detail. For certain sensitive resources (e.g., agricultural lands and wetlands), this section introduces key regulations governing development which may impact these resources. **Chapter 6** describes in detail the variety of measures available to avoid or minimize, to the maximum extent practicable, potentially adverse environmental impacts resulting from the proposed action.

We focus on two types of effects: direct and indirect. In promulgating regulations under the National Environmental Policy Act (NEPA) at 40 CFR 1508.8, the Council on Environmental Quality defines direct effects as those occurring at the same time and in the same place as the proposed action itself; indirect effects are those occurring later in time and farther away, but which are still reasonably foreseeable.

The remainder of this chapter is organized in three parts:

- **Section 5.2** summarizes the analysis of the direct environmental impacts of the proposed action;
- **Section 5.3** summarizes the analysis of the indirect and secondary impacts environmental impacts of the proposed action; and
- **Section 5.4** considers the potential cumulative impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions.

5.2 Direct Effects

This section discusses the potential direct and near-term environmental impacts associated with the proposed action. As explained above, the potential direct impacts under the proposed action are similar to the direct impacts under the "no action" alternative. **Table 5-1** below summarizes potential direct environmental impacts of the construction, operation, and maintenance of transmission infrastructure by transmission type.

Table 5-1. Summary of Potential Environmental Impacts by Transmission Type

Resource	Overhead	Underground	Underwater
Geology and Soil	• Ground disturbance and soil erosion	• Ground disturbance and soil erosion	• Ground disturbance and soil erosion • Modification of river and lakebed microtopography • Suspension, transport, and resettlement of sediment
Land Use	• Increased forest clearing and vegetation removal	• Increased forest clearing and vegetation removal	• No likely impacts

Resource	Overhead	Underground	Underwater
Surface Water and Groundwater Resources	• Sedimentation in runoff • Increased turbidity • Changes in water flow patterns • Increased likelihood of pollutants reaching water bodies • Reduction in the rate of groundwater recharge	• Sedimentation in runoff • Increased turbidity • Changes in water flow patterns • Increased likelihood of pollutants reaching water bodies • Reduction in the rate of groundwater recharge	• Sedimentation in runoff, increased turbidity, changes in water flow patterns, increased likelihood of pollutants reaching water bodies • Reduction in the rate of groundwater recharge and localized increases in water temperature
Wetlands	• Disruption to native wetland vegetation, habitats, and obligate organisms • Disruption to sediment and shoreline stabilization • Introduction of non-native and invasive species	• Disruption to native wetland vegetation, habitats, and obligate organisms • Disruption to sediment and shoreline stabilization • Introduction of non-native and invasive plant species	• Disruption to native wetland vegetation, habitats, and obligate organisms • Disruption to sediment and shoreline stabilization • Introduction of non-native and invasive plant species
Flooding	• Elevated flood risk • Reduced rate of infiltration of water into soil	• Elevated flood risk • Reduced rate of infiltration of water into soil	• Elevated flood risk • Reduced rate of infiltration of water into soil
Coastal Resources	• Increased risk of coastal erosion • Sediment runoff and turbidity • Disruption of coastal habitats and ecosystems	• Increased risk of coastal erosion • Sediment runoff and turbidity • Disruption of coastal habitats and ecosystems	• Increased risk of coastal erosion • Sediment runoff and turbidity • Disruption of coastal habitats and ecosystems • Accidental release of fuel, hazardous materials, suspended sediment, trash or debris
Air	• Increased air pollutants from construction and maintenance activity • Risk of air pollution from wildfires	• Increased air pollutants from construction and maintenance activity	• Increased air pollutants from construction and maintenance activity
Plants and Animals	• Destruction and modification of plant and animal habitat • Displacement of wildlife • Introduction of non-native and invasive plant species	• Destruction and modification of plant and animal habitat • Displacement of wildlife • Introduction of non-native and invasive plant species	• Destruction and modification of plant and animal habitat • Displacement of wildlife • Introduction of non-native and invasive plant species • Disruption of aquatic ecosystem

Resource	Overhead	Underground	Underwater
Forests	• Permanent conversion of forest land to non-forest uses • Forest fragmentation • Impacts on wood-using industries • Reduced sequestration of carbon • Changes to forest composition, ecosystem • Habitat loss • Increased fire risk	• Permanent conversion of forest land to non-forest uses • Forest fragmentation • Impacts on wood-using industries • Reduced sequestration of carbon • Changes to forest composition, ecosystem • Habitat loss	• No likely impacts
Agricultural Resources	• Disruption of crop yield, farming operations, production, and revenue • Disruption of access	• Disruption of crop yield, farming operations, production, and revenue • Disruption of access	• No likely impacts
Aesthetic Resources	• Presence of transmission poles, cables, and other permanent facilities such as substations • Tree clearing and vegetation removal	• Tree clearing and vegetation removal	• Minimal/temporary impact during construction
Historical and Archeological Resources	• Disturbance of archeological and historical sites and artifacts	• Disturbance of archeological and historical sites and artifacts	• No likely impacts
Open Space and Recreation	• Presence of transmission poles, visual intrusion • Land clearing • Decreased visitation • Safety threats to users of recreational vehicles • Access restrictions	• Tree clearing to prevent root disruption • Access restrictions	• No likely impacts
Critical Environmental Areas	• Disruption to ecosystems • Habitat destruction, fragmentation • Biodiversity loss	• Disruption to ecosystems • Habitat destruction, fragmentation • Biodiversity loss	• Modification of sea, river, and lakebed composition • Degradation in water quality
Transportation	• Temporary road closures and increased traffic • Potential hazard for aircrafts during landing and takeoff • Safety threats to users, workers	• Longer road closures and increased traffic due to trenching • Safety threats to users, workers	• Disruption to commercial and recreational vessels

Resource	Overhead	Underground	Underwater
Noise, Odor, and Light	• Noise and light from construction activity and land clearing • Noise from active transmission lines	• Noise and light from construction activity and land clearing	• Noise from construction activity
Human Health and Safety	• Hazards to worker safety from hazardous material and unsafe contact with transmission lines • Risk to public and workers from fallen lines • Potential risks from EMF	• Hazards to worker safety from hazardous material and unsafe contact with transmission lines • Potential risks from EMF	• Hazards to worker safety during construction • Potential risks from EMF
Community Plans	• Disturbance to communities and property owners • Aesthetic changes and noise • Changes in property value • Disruption to public utilities and services	• Disturbance to communities and property owners from noise • Disruption to public utilities and services	• No likely impacts
Community Character	• Disruption to residents and businesses • Changes in population density and composition	• Disruption to residents and businesses	• No likely impacts

5.2.1 Geology and Soil

Construction, operation, and maintenance of transmission lines has adverse impacts on the State's soil and geologic features, though the severity of these impacts varies based on location and mitigation measures. The majority of soil impacts would be near-term and occur during the construction phase. Overstory vegetation removal and ground disturbance associated with clearing the transmission route and other construction activities could result in soil erosion. However, the use of erosion control measures and site-specific planning can reduce these risks in many areas.

Furthermore, transmission line construction could necessitate excavation of soils and rocks, which could make landslides more likely, especially in regions with high rainfall or seismic activity. For regions prone to landslides, mitigation efforts such as slope stabilization and avoidance of high-risk zones during route planning minimize the likelihood of adverse impacts. Bedrock blasting during construction could result in localized impacts to surficial geography, but careful management of blasting activities and adherence to best practices for safety and environmental protection mitigate long-term damage to geological features.

Compared to overhead transmission, installing underground cables would cause more extensive soil disturbance, as it requires grading, trenching, and other excavation. Construction of underwater transmission cables could result in localized modification of lakebed and river microtopography as well as the suspension, transport, and

resettlement of riverine and lacustrine sediment. These impacts, while localized, may be managed through sediment control practices and pre-construction assessments to limit disruption to aquatic environments.[409,410]

Long-term soil impacts would result from clearing and grading for permanent access/maintenance roads, transmission structures, transition stations, and converter stations. These activities could result in soil compaction and erosion. To address these issues, soil stabilization and drainage controls can be implemented, accompanied by site restoration that is performed as appropriate. In areas where transmission lines cross agricultural lands, soil compaction and erosion may reduce the agricultural potential of the land. Mitigation strategies, such as limiting the use of heavy machinery and applying soil rehabilitation techniques post-construction, could aid in minimizing these long-term effects.

5.2.2 Land Use

The impact of construction of transmission lines on land depends on its pre-existing land uses. Transmission line construction may require the acquisition of land for rights-of-way (ROW), which is often cleared and maintained to accommodate transmission lines and their supports. Forested areas along the transmission corridor need to be cleared entirely in order for construction to proceed, and maintaining the ROW requires periodic clearing of trees and other vegetation to prevent regrowth. Maintaining clear ROWs is important for avoiding and/or minimizing contact between transmission infrastructure and vegetation, especially during high winds which can result in damage to transmission infrastructure. To the extent that transmission lines cross agricultural lands, construction would require traversing the ROW with heavy machinery, which could curtail agricultural potential of the land.

Construction of underwater transmission lines would result in additional vessel traffic, and commercial or recreational vessels would have limited to no access to the area surrounding the work site. Emergency repair activities could also result in temporary impacts on existing commercial and recreational uses near the work site.

The presence of high-voltage transmission lines may also reduce property values for adjacent residential buildings due to noise, aesthetic impacts, and potential health and safety hazards. The effect of transmission lines on property values depends on several factors, including proximity to towers and lines, views of towers and lines, the type and size of transmission structures, the appearance of easement landscaping, and the surrounding topography.[411]

5.2.3 Surface Water and Groundwater Resources

Construction and operation of transmission infrastructure could have adverse impacts on both surface water and groundwater resources. Removal of vegetation during construction could increase erosion of adjacent soils during rain events, thus causing sediment to be deposited in streams, lakes, and rivers. Ground disturbance during construction activities could also result in increased erosion and sedimentation in runoff. During construction along transmission routes that cross water bodies, trenching would result in increased turbidity, potential downstream sedimentation, changes in water flow patterns, and increased likelihood of pollutants reaching waterbodies. If horizontal directional drilling (HDD) is employed during installation of underwater cables, there is potential for leaks of HDD fluid that could impact surface water quality.[412] During operation,

[410] U.S. Department of Energy. 2014. Champlain Hudson Power Express Transmission Line Project Environmental Impact Summary. Accessed on November 13, 2024 at: http://chpexpresseis.org/library.php.

[411] Environment and the Appraiser. 2007. Power Lines and Property Values Revisited. Accessed on November 13, 2024 at: https://rpa-inc.com/wp-content/uploads/2020/03/Power-Lines-and-Property-Values-Revisited.pdf.

[412] Utility Magazine. 2021. Accessed on November 13, 2024 at: https://utilitymagazine.com.au/what-is-a-frac-out-in-hdd/.

heat loss from underwater transmission lines could result in localized increases in water temperature in streams, lakes, and rivers.

Soil compaction during construction could reduce the rate of groundwater recharge.[413] Reductions in groundwater recharge can adversely impact streams, wetlands, and other water bodies by lowering the volume and rate of base flow to them. Reductions in groundwater recharge to aquifers can also adversely impact the yield of water supply wells. Increased bedrock fracturing near rock blasting areas could increase turbidity in groundwater.

Accidental release of hazardous materials during transmission construction and transportation of supplies could contaminate surface water and groundwater resources. The environmental effects of a release would depend on the material released and the location of the release. Potential releases could range from a small amount of fuel spilled during a transfer operation at the ROW to the loss of several thousand gallons of fuel into a riparian drainage.[414] Impacts from spills would typically be minor due to the low frequency of spill occurrence and relatively low volume of materials being handled at any one time. The transmission cables do not contain any hazardous fluids and thus carry limited risk themselves for sediment or subsequent water contamination.

5.2.4 Wetlands

To the extent that transmission lines cross wetland areas, construction, operation, maintenance, and emergency repair phases could adversely impact wetlands. During construction, disturbances could stem from soil displacement, altered surface runoff, and vegetation removal, which could disrupt native plant life and the wetland's roles in wildlife habitat, groundwater recharge or discharge, sediment and shoreline stabilization, flood storage, nutrient removal, sediment and toxicant retention, and production export.[415] Trenching, grading, clearing, and other soil disturbance activities could permanently affect wetland soils, vegetation, and hydrology. Many species, particularly amphibians, reptiles, and nesting birds, are less mobile and may experience more significant impacts if unable to relocate. The long-term conversion of forested wetlands to shrub or emergent wetlands can lead to lasting habitat loss for species that rely on mature trees and a closed canopy, while favoring species adapted to open, shrubby environments.[416] Construction may also introduce invasive species, which can spread quickly with the movement of water. Although wetland functions like flood storage and water purification may remain, changes in habitat structure can shift the wildlife community composition over time.

In the operational phase, permanent ecological shifts can occur, particularly when forested wetlands are converted to emergent or shrub wetlands, changing the types of habitats available for certain wildlife species. The routine vegetation management along the ROW involves periodic cutting or clearing to prevent interference with the transmission line.[417] While these activities usually avoid altering the hydrology of the wetlands, they can lead to lasting changes in vegetation structure, preventing the re-establishment of larger trees and potentially

[413] New Jersey Stormwater Best Management Practices Manual. 2004. Accessed on November 13, 2024 at: https://dep.nj.gov/wp-content/uploads/stormwater/bmp/nj_swbmp_6-print.pdf.

[414] TransWest Express EIS. Section 3.18 - Public Health and Safety. Accessed on November 13, 2024 at: https://eplanning.blm.gov/public_projects/nepa/65198/78875/90744/25-Chapter3.18_Health-Safety.pdf.

[415] Champlain Hudson Power Express, Inc. 2012. Supplement to the Section 404/10 Permit Application for the Champlain Hudson Power Express Project "Attachment G: Wetlands Functions and Values Assessment." Accessed on November 13, 2024 at http://chpexpress.com/wp-content/uploads/2020/03/Attachment-G-Wetlands-Functions-And-Values-Assessment.pdf.

[416] The 2022 amendment to the Wetlands Act looks to mitigate effects on these vulnerable species, protecting habitats of rare, threatened, and endangered (RTE) species, species of special concern, and species identified by the State Wildlife Action Plan.

[417] Champlain, VT LLC. 2014. New England Clean Power Link HVDC Transmission Project Presidential Permit Application. Accessed on November 13, 2024 at http://www.necplink.com/docs/Application_for_a_Presidential_Permit.pdf.

increasing sunlight exposure in the ROW.[418] This could influence the growth of wetland vegetation, potentially leading to slight increases in surface water temperatures during summer months. In shallow wetland areas, even slight temperature increases can affect aquatic organisms, particularly fish and amphibians that are sensitive to thermal changes. Warmer water temperatures may also accelerate algae growth, increasing the biological oxygen demand (BOD) and reducing oxygen levels, which can stress aquatic wildlife and reduce overall water quality.

Emergency repairs could require trenching or excavation to address defective cable sections, causing impacts similar to those during initial construction. However, if cables are installed through HDD, emergency repairs could be done without disturbing the wetland surface, thereby protecting the area's ecological balance. When emergency repairs do affect wetlands, permanent sediment turbidity can occur, and invasive and non-native wetland obligate species can be introduced.

Restoration measures, such as mulching and seeding, help to speed habitat recovery, with full restoration often achieved within a growing season, though it may take up to a year depending on seasonal conditions.[419]

The Freshwater Wetlands Act (Environmental Conservation Law article 24) of New York State, originally enacted in 1975, was substantially amended in 2022 to expand NYSDEC's jurisdiction and impact permitting for transmission projects (see L 2022, ch 58, part QQ). The Act aims to preserve, protect, and conserve New York's freshwater wetlands by regulating activities that may negatively impact these areas. Wetlands are identified primarily by vegetation type and must generally be at least 12.4 acres (7.4 acres starting January 1, 2028) to qualify for protection, with certain smaller wetlands included if they are wetlands of unusual importance. During construction, transmission projects that could affect protected wetlands or their adjacent 100-foot buffer zones[420] require a permit and must minimize impacts, often with compensatory mitigation for any significant alterations.[421]

5.2.5 Flooding

Construction of transmission lines could result in increased risk of localized flooding in areas near the transmission corridor. Flooding impacts vary depending on the type of construction and the particular geographical features of the site. The primary impacts are linked to land disturbance, changes in water flow, soil compaction, and alterations to existing drainage patterns. These impacts can exacerbate flooding risks, change how floodwaters behave, or increase the severity of local flooding events.

Removal of natural vegetation during installation of transmission structures could reduce the rate of infiltration of water into the soil, creating larger runoffs into nearby water bodies and in turn elevating flood risks.[422] Operating heavy machinery during construction could result in soil compaction, which reduces the ability of the soil to absorb water and increases the risk of flooding. Compacted soils could also exacerbate erosion, which can further affect local drainage systems. Erosion during construction could also result in sedimentation of

[418] EPA Region 5. 2012. Wetlands Supplement: Incorporating Wetlands into Watershed Planning. Accessed on November 13, 2024 at https://www.epa.gov/sites/default/files/2016-03/documents/final_supplement_from_pg_september_2012.pdf.

[419] New Hampshire Department of Resources and Economic Development. 2010. Best Management Practices Manual for Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire. Accessed on November 13, 2024 at https://www.energy.gov/sites/prod/files/2015/06/f22/NHBMPM.pdf.

[420] Nutrient poor wetlands and vernal pools will have 300-feet and 800-feet adjacent areas, respectively.

[421] NYSDEC. Freshwater Wetland Program. Accessed on November 13, 2024 at https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program.

[422] Agronomic Crops Network. 2018. Soil Infiltration. Accessed on November 13, 2024 at: https://agcrops.osu.edu/newsletter/corn-newsletter/2018-03/soil-infiltration.

streams and rivers, which reduces their capacity to carry floodwaters, thereby increasing the risk of flooding downstream.

5.2.6 Coastal Resources

Construction of transmission lines and related infrastructure has the potential to disrupt various coastal resources. Coastal construction activities may contribute to shoreline erosion by disturbing soil and altering natural landforms. The coastal areas within New York State most vulnerable to erosion hazards are mapped and afforded protection against the impacts of erosion pursuant to Environmental Conservation Law Article 34, the Coastal Erosion Hazards Areas (CEHA) Law. NYSDEC is empowered by CEHA to map coastal erosion hazard areas and to regulate activities and development within these areas in order to protect vital natural features, such as nearshore areas, beaches, bluffs, and dunes, from erosion resulting from both natural and human activity. NYSDEC regulates development in these areas through the CEHA Permit Program, which makes certain activities in the mapped coastal erosion hazard areas subject to NYSDEC approval and granting of a Coastal Erosion Management Permit.[423] The Local Waterfront Revitalization Program (LWRP), administered by the NYSDOS in partnership with waterfront municipalities, also guides development along coastlines and waterfronts in participating coastal and inland communities in order to preserve and protect water quality, sensitive resources, fisheries, and public access, while also encouraging appropriate redevelopment of underutilized waterfronts.[424] Construction activities may also lead to sediment runoff and increased turbidity in nearby bodies of water, which can negatively impact marine habitats and sensitive coastal ecosystems. Furthermore, as noted previously, the risk of localized flooding may increase near transmission corridors, particularly in low-lying coastal regions. Human activities associated with coastal erosion include the removal of vegetation, soil exposure, and the construction of "hardened" structures along coastlines.[425]

Construction of overhead, underground, and underwater transmission lines, as well as other related facilities, has the potential to impact sensitive shoreline areas. In addition, construction of underwater lines (e.g., to connect to offshore wind structures) could result in the accidental release of fuel, hazardous materials, suspended sediment, trash or debris.[426]

5.2.7 Air

Operation of heavy equipment during construction of transmission infrastructure has temporary adverse effects on air quality near the construction site. Bulldozers, rock trenchers, bucket loaders, cranes, and other equipment that use diesel internal combustion engines emit air pollutants such as diesel particulate matter, nitrogen oxide (NO_X), reactive organic gases, and greenhouse gases (GHG).[427] Installation of underwater cables also requires operating diesel-powered heavy equipment, barges, generators, and boats that emit pollutants. Use of heavy equipment along the construction corridor on land would also cause localized fugitive dust emissions. Air pollutants associated with maintenance and repair activities also result from heavy equipment use and fugitive dust emissions due to earthmoving activities.

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[423] NYC Emergency Management. NYC's Risk Landscape: A Guide to Hazard Mitigation. Accessed on November 13, 2024 at: https://www.nyc.gov/assets/em/downloads/pdf/hazard_mitigation/nycs_risk_landscape_chapter_4.2_coastalerosion.pdf.

[424] New York State. New York State Coastal Management Program and Final Environmental Impact Statement. Accessed on November 13, 2024 at: https://dos.ny.gov/system/files/documents/2023/04/revised-nys-cmp-2023_0.pdf.

[425] NYSDEC. Coastal Management. Accessed on November 13, 2024 at: https://dec.ny.gov/environmental-protection/water/water-quantity/dam-safety-coastal-flood-protection/coastal-management.

[426] Bureau of Ocean Energy Management. 2023. Empire Offshore Wind Final Environmental Impact Statement. Volume 1. Accessed on November 13, 2024 at: https://www.boem.gov/renewable-energy/state-activities/empire-wind-final-eis.

[427] Placer County Air Pollution Control District. Analyzing Construction Emissions. Accessed on November 13, 2024 at: https://www.placerair.org/DocumentCenter/View/2048/Chapter-3--Analyzing-Construction-Emissions-PDF.

High-voltage power lines are known sources of atmospheric pollutants such as ozone and nitrogen oxides.[428] For example, corona discharge of ozone and nitrogen oxides occurs due to the ionization of air close to the conductors. While transmission lines are designed to limit this effect, minor imperfections on conductors such as a scratch on the wire or a protrusion on hardware can increase the rate of corona discharge.[429]

Operating transmission lines are also associated with wildfire risks, particularly in dry and windy conditions. When a transmission line fails, it can spark fires, which release large amounts of smoke, particulate matter, and carbon dioxide into the air and negatively impact air quality.

5.2.8 Plants, Animals, and Forest Resources

Construction and maintenance of transmission lines could destroy individual plants and animals or might alter their habitat. Transmission buildup under the baseline and the proposed action could impact both terrestrial and aquatic ecosystems.

Impacts on Terrestrial Species

Impacts to terrestrial species could involve direct mortality, injuries, or sensory disturbance. Habitat loss or modification of existing habitat during construction can adversely affect the ability of various species to survive and reproduce. There is potential for wildlife collisions with vehicles and heavy equipment employed during construction. Noise from equipment during construction or maintenance could temporarily displace or disturb wildlife. While adverse impacts to wildlife in the form of mortality or physical injury could occur, population-level effects are not expected for construction activities that take place along existing ROWs, and the majority of adverse effects would be short-term. Construction activities that take place along new ROWs in forested areas, however, could cause habitat fragmentation and permanent displacement of breeding populations.

Transmission construction impacts could also include forest fragmentation and the loss and degradation of wooded habitat, as all trees and bushes would have to be cleared along the transmission corridors.[430] A transmission line ROW can fragment a larger forest block into smaller tracts. Fragmentation makes interior forest species more vulnerable to predators, parasites, competition from edge species, and catastrophic events. The continued fragmentation of a forest can cause a permanent reduction in species diversity and suitable habitats.[431]

Construction vehicles could bring invasive and/or non-native plant species into forests. The opening of the forest floor to sunlight through tree clearing of the ROW could encourage invasive species to proliferate. Invasive species, once introduced, have few local natural controls on their reproduction and easily spread. Their spread can alter the ecology of a forest as they out-compete native species for sunlight and nutrients, further reducing suitable habitat and food sources for local wildlife.[432] Construction activities can also inadvertently introduce or encourage invasive and non-native species in wetland ecosystems during transportation of soil and equipment if appropriate preventative measures are not taken.

In the long term, transmission lines can alter habitats for certain species, increase the risk of habitat destruction due to wildfires, increase bird mortality through collisions, and adversely impact the health of animal species

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[428] Vito, S.D., A.D. Giudice and G.D. Francia. 2024. Electric Transmission and Distribution Network Air Pollution. *Sensors (Basel)*, 24(2). Accessed on November 13, 2024 at: https://pmc.ncbi.nlm.nih.gov/articles/PMC10818988/.

[429] Huntley - Wilmarth Project Certificate of Need Application. Transmission Line Operating Characteristics. Accessed on November 13, 2024 at: https://mn.gov/eera/web/project-file?legacyPath=/opt/documents/34760/Chapter%206.pdf.

[430] Public Service Commission of Wisconsin. Environmental Impacts of Transmission Lines. Accessed on November 13, 2024 at: https://www.nrc.gov/docs/ML1209/ML12090A853.pdf.

[431] *Ibid.*

[432] *Ibid.*

through exposure to high-frequency electromagnetic fields (EMFs) created by high-voltage transmission lines.[433]

Impacts on Aquatic Species

Impacts to aquatic species and habitats during construction of transmission lines would result from temporary disturbance of the riverbed, increases in sediment disturbance, increases in turbidity, and water quality degradation. Increased turbidity could affect light penetration and ecological productivity, which can harm fish and other aquatic life.[434] Underwater noise created during installation of submarine transmission lines can alter the acoustic environment of water bodies, which can adversely affect the behavior of various aquatic organisms.

In the long term, exposure to EMFs produced by underwater cables can potentially affect benthic organisms by disturbing their reproductive cycles and altering their behavior.[435] Shielding cable conductors with an insulator can eliminate any electric field loss outside the cable, thus mitigating the impact on aquatic species. Research indicates that long-term exposure to magnetic fields created by underwater cables does not significantly impact the behavior of benthic organisms.[436] Heat loss from underwater cables could result in higher water and sediment temperatures, which can affect some sediment-dwelling and seafloor species.[437] These impacts would be highly localized and are not expected to cause population-level effects.[438]

Impacts on Forest Resources

In addition to impacts on wildlife and biodiversity, forest clearing and fragmentation resulting from the construction of transmission lines would decrease the resilience of forest ecosystems to regenerate or suppress fires.[439] Forest clearing could also disrupt the wood-using and forest product industries. Local forest product industries contribute over 41,000 direct jobs and $13.1 billion in annual output to the State's economy.[440] Other specialized forest-based industries, including economically important maple sugaring[441] and Christmas tree

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[433] Aliyari, H., H. Sahraei, S. Golabi, M. B. Menhaj, M. Kazemi and S. H. Hosseinian. 2022. The Effect of Electrical Fields From High-voltage Transmission Line on Cognitive, Biological, and Anatomical Changes in Male Rhesus macaque Monkeys Using MRI: A Case Report Study. *Basic and Clinical Neuroscience*, 13(4):433-442. Accessed on November 13, 2024 at: https://pmc.ncbi.nlm.nih.gov/articles/PMC9759772/#:~:text=Living%20near%20high%2Dvoltage%20power,to%20animal%20and%20human%20health.

[434] USGS. 2018. Turbidity and Water. Accessed on November 13, 2024 at: https://www.usgs.gov/special-topics/water-science-school/science/turbidity-and-water.

[435] Hermans, A., H. V. Winter, A. B. Gill and A. J. Murk. 2024. Do Electromagnetic Fields from Subsea Power Cables Effect Benthic Elasmobranch Behaviour? A Risk-Based Approach for the Dutch Continental Shelf. *Environmental Pollution*, 346(123570). Accessed on November 13, 2024 at: https://www.sciencedirect.com/science/article/pii/S0269749124002847#:~:text=Potential%20effects%20from%20EMFs%20that,%2C%202009)%2C%20which%20could%20lead.

[436] Bochert, R. and M. L. Zettler. 2004. Long-Term Exposure of Several Marine Benthic Animals to Static Magnetic Fields. *Bioelectromagnetics*, 25(7):498-502. Accessed on November 4, 2024 at: https://onlinelibrary.wiley.com/doi/10.1002/bem.20019.

[437] Bureau of Ocean Energy Management. 2023. Supporting National Environmental Policy Act Documentation for Offshore Wind Energy Development Related to Heat from Buried Transmission Cables. Accessed on November 13, 2024 at: https://www.boem.gov/sites/default/files/documents/renewable-energy/studies/Transmission_Cable_Heat_WhitePaper.pdf#:~:text=In%20general%2C%20transmission%20cables%20for,species%20that%20inhabit%20that%20sediment.&text=Most%20seafloor%20organism%20communities%20inhabit,by%20heat%20from%20submarine%20cables.

[438] Department of Energy. 2014. Champlain Hudson Power Express Transmission Line Project Environmental Impact Summary. Accessed on November 13, 2024 at: http://chpexpresseis.org/docs/library/final-eis/full/1_CHPE%20FEIS_Summary_Aug14.pdf.

[439] NYSDEC. New York State Forest Action Plan December 2020. Accessed on October 29, 2024 at: https://extapps.dec.ny.gov/docs/lands_forests_pdf/nysfap.pdf.

[440] New York Department of Environmental Conservation. Forest Products Utilization. Accessed on December 5, 2024 at: https://dec.ny.gov/nature/forests-trees/forest-products-utilization

[441] New York produced 845,000 gallons of maple syrup in the State in 2022, which ranked second in the nation. New York State. 2022. Governor Hochul Promotes New York State Maple Industry During Maple Month. Accessed December 5, 2024 at: https://www.governor.ny.gov/news/governor-hochul-promotes-new-york-state-maple-industry-during-maple-month#:~:text=New%20York%20maple%20producers%20experienced,the%20nation%20in%20maple%20production.

production, [442] as well as agroforestry, may also face challenges due to reductions in forest activity or productivity. These impacts would be more pronounced in rural communities, where forests constitute a larger share of the local economy. For example, the forest sector in the North Country region (north of the Capital Region and Mohawk Valley), a mostly rural and forested area, represents nearly five percent of the total economic output and employment of the region, the highest percentage of any region in the State.[443] Disturbances to forest resources could also affect carbon sequestration and forest carbon markets. Clearing forests for transmission lines reduces forests' capacity to store carbon, contributing to further declines in net carbon storage, which has been decreasing in recent decades.[444] This could also impact efforts to use carbon markets to support forest conservation.[445]

5.2.9 Agricultural Resources

Construction of transmission structures on agricultural lands has the potential to adversely impact farming operations, production, and revenues. Soil mixing, erosion, rutting, and compaction are interrelated impacts commonly associated with transmission construction that could affect future crop yields.[446] Soils could be mixed during the excavation of pole foundations or during the undergrounding of electrical lines. Soil compaction due to operation of heavy construction machinery can limit the access of crop roots to water and nutrients, leading to reduced crop productivity.[447] Agricultural soils that have been improperly protected or mitigated may suffer decreased yields for several years after the construction of transmission lines is completed.[448]

In the long term, presence of transmission structures on agricultural lands could impact farm operations and farming revenue. Transmission lines could affect field operations, irrigation, aerial spraying, wind breaks, and future land uses. Placement of transmission structures in agricultural lands could create problems for turning field machinery and maintaining efficient fieldwork patterns, increase the likelihood of weed encroachment, increase safety hazards, interfere with moving irrigation equipment, and hinder future consolidation of farm fields.[449] Specific agriculture-related impacts would depend on transmission line design and the type of agricultural production.

The RAPID Act continues the Farmland Protection Working Group that will issue recommendations to mitigate adverse impacts to farmland from generation and transmission siting. The Act also introduces additional protections for farmland, including a requirement to design generation and transmission facilities in a manner that avoids, minimizes, or mitigates to the maximum extent practicable potential significant adverse impacts to

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[442] Christmas tree production has a $14 million economic in the State. New York State Department of Agriculture and Markets. 2024. New York State Department of Agriculture and Markets Kicks Off the Holiday Season With Annual Christmas Tree Cutting. Accessed on December 5, 2024 at: https://agriculture.ny.gov/news/new-york-state-department-agriculture-and-markets-kicks-holiday-season-annual-christmas-tree.

[443] New York Wood Products Development Council. Economic Value of New York's Forest Resource. Accessed on December 5, 2024 at: https://woodproducts.ny.gov/economic-value-new-yorks-forest-resource.

[444] NYSDEC. New York State Forest Action Plan December 2020. Accessed on October 29, 2024 at: https://extapps.dec.ny.gov/docs/lands_forests_pdf/nysfap.pdf.

[445] NYSDEC. Forest Carbon Markets. Accessed on December 5, 2024 at: https://dec.ny.gov/nature/forests-trees/climate-change/forest-carbon-markets

[446] Public Service Commission of Wisconsin. 2012. Environmental Impacts of Transmission Lines. Accessed on November 13, 2024 at: https://www.nrc.gov/docs/ML1209/ML12090A853.pdf.

[447] Zhang, B., Y. Jia, H. Fan, C. Guo, J. Fu, S. Li, M. Li, B. Liu and R. Ma. 2024. Soil Compaction Due to Agricultural Machinery Impact: A Systematic Review. *Land Degradation and Development*, 35(10):3256-3273. Accessed on November 13, 2024 at: https://onlinelibrary.wiley.com/doi/10.1002/ldr.5144.

[448] Public Service Commission of Wisconsin. 2012. Environmental Impacts of Transmission Lines. Accessed on November 13, 2024 at: https://www.nrc.gov/docs/ML1209/ML12090A853.pdf.

[449] *Ibid.*

land used in agricultural production, with additional consideration for land within an agricultural district or land that contains mineral soil group 1-4.[450]

5.2.10 Aesthetic Resources

Construction of transmission infrastructure under the proposed action would result in temporary visual impacts due to presence of construction equipment and activities. Generally, transmission structures are assembled at the foundation site and set in place using cranes and other heavy equipment.[451] Helicopters may bring supplies to areas that are inaccessible to large ground-based construction equipment. Trucks and heavy equipment support the installation of transmission wires. Equipment necessary for clearing, trench excavation, cable installation, backfilling, and restoration are typically located at construction sites. Temporary support facilities also need to be established along portions of the transmission route. Along the aquatic portions of transmission projects, cable-laying vessels and support vessels would be visible on the water surface.

In the long term, overhead transmission lines and towers can permanently alter the visual landscape along the transmission route, potentially affecting views of natural, cultural, and historic beauty even from a distance.[452] Transmission facilities are visually conspicuous features that can extend for many miles across natural landscapes without significant topographic changes. Construction of overhead transmission lines through wooded areas involves tree clearing and vegetation removal, resulting in a barren stretch of land in an otherwise forested area. The large, industrial-looking lattice steel towers, which have high form and color contrast with the surrounding environment, can further affect the aesthetic resources along the transmission route. Additionally, other permanent facilities, such as transition stations, converter stations, and substations, would alter the visual character of the landscape. Underground transmission lines, however, will not result in these long-term visual impacts.

The Department of State Office of Planning, Development and Community Infrastructure recommends areas for designation as Scenic Areas of Statewide Significance (SASS) based on the scenic qualities of coastal landscapes. SASS designation protects scenic landscapes through review of projects requiring State or federal actions, including direct actions, permits, or funding. When considering proposed actions that could affect a scenic area of statewide significance the agency must consider whether the action would be likely to impair the scenic beauty of the identified resource. Impairment could include, for example, irreversible modification of geologic forms; destruction or removal of vegetation; modification or removal of structures; and addition of structures that would reduce views or diminish the scenic quality of the resource.

5.2.11 Historic and Archeological Resources

Archeological and historical sites, including cultural resources of Indigenous Nations, are protected resources that may sustain damage from digging, heavy equipment, uprooting trees, exposure to erosion or the elements, or vandals. Transmission line construction and maintenance may disturb archeological and historical sites.

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[450] Shaw, N. C. 2024. Through the RAPID Act, the NYPSC Is Losing Jurisdiction Over Transmission Siting – Or Is It? Foley Hoag. Accessed on November 13, 2024 at: https://foleyhoag.com/news-and-insights/blogs/energy-and-climate-counsel/2024/may/through-the-rapid-act-the-nypsc-is-losing-jurisdiction-over-transmission-siting-or-is-it/.

[451] Xcel Energy. Transmission Line Construction Process. Accessed on November 13, 2024 at: https://www.transmission.xcelenergy.com/staticfiles/microsites/Transmission/Transmission%20Line%20Construction.pdf.

[452] National Parks Service. Electrical Power Transmission and Distribution. Accessed on November 13, 2024 at: https://www.nps.gov/subjects/renewableenergy/transmission.htm.

Overground transmission structures, given their bases are established underground, could encounter and disturb archeological and historical sites and artifacts.[453] Overhead lines are in contact with the ground for a small portion of their total length, while the entirety of an underground line may disturb sensitive sites. It is unlikely that underwater transmission lines would disturb historic or archeological sites.

Each construction project funded, licensed, or approved by State or federal agencies must undergo a review by the State Historic Preservation Office's archeology unit to determine whether the project site falls within a known area of archeological sensitivity. If so, phased surveys will determine the extent of the potential impact.[454] If artifacts are discovered as part of the pre-development review, additional surveys may be required. Federal process dictates that any impacts to historic and archaeological resources should be avoided, minimized, or mitigated – in that order.[455]

5.2.12 Open Space and Recreation

As discussed above, construction can require clear cutting and maintaining wide swaths of land free of tall vegetation. The presence of transmission towers may also limit future recreational project development, alter local habitat for native animals, impose safety concerns that deter visitation, and/or pose safety threats to recreational vehicles like snowmobiles and all-terrain vehicles. Underground lines are less disruptive to open spaces, but large trees must be removed to prevent root disruption. Underwater lines are unlikely to be disruptive to recreation or open spaces except during the time of laying out the cables.

5.2.13 Critical Environmental Areas

Critical environmental areas (CEAs) are frequently designated for their ecological significance and scenic and recreational value. Land transmission lines could disrupt ecosystems, destroy habitats, result in biodiversity loss, and degrade water quality during construction as access roads are built, vegetation is cleared, and heavy machinery and blasting move natural material. The large towers of overhead lines are a disruption to CEAs. Once completed, underground lines are less visible, but trenching an underground line through farmland, forest, wetland, and other natural areas can cause land disturbances.[456] Underwater lines could modify sea, river, or lakebed composition and suspension of sediments that could influence aquatic life.[457] The natural soundscape of CEAs is disrupted by construction of transmission lines, and in the case of overhead lines, during high humidity or precipitation events. Corona discharge produces light and noise pollution that can be distracting to animals and visitors of CEAs. Given safety concerns, access to CEAs may also be limited given dangers of high voltage, and in the case of overhead transmission, large industrial structures.

5.2.14 Transportation

Highways, railways, and transmission lines operate on a "right-of-way," which began from 19th century federal land grants to encourage railroad development across the country. ROWs are often clear of natural resources and residential or commercial structures. Co-locating a new transmission line on an existing ROW can limit the

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[453] Aspen Environmental Group. Transmission Line Construction. Accessed on November 13, 2024 at: https://ia.cpuc.ca.gov/environment/info/aspen/cltp/archive/files_8_26_14/_5transmissionlineconstructionfactsheet.pdf.

[454] New York State Parks, Recreation, and Historic Preservation. Environmental Review. Accessed on November 13, 2024 at: https://parks.ny.gov/shpo/environmental-review/.

[455] Smith, J. 2016. Unearthing Archaeological Finds on a Jobsite. Construction Business Owner. Accessed on November 13, 2024 at: https://www.constructionbusinessowner.com/management/unearthing-archaeological-finds-jobsite.

[456] Public Service Commission of Wisconsin. Underground Electric Transmission Lines. Accessed on November 13, 2024 at: https://psc.wi.gov/Documents/Brochures/Under%20Ground%20Transmission.pdf.

[457] U.S. Department of Energy. 2014. Champlain Hudson Power Express Transmission Line Project. Accessed on November 13, 2024 at: http://chpexpresseis.org/docs/library/final-eis/full/1_CHPE%20FEIS_Summary_Aug14.pdf

potential impacts of a project by reducing the need to remove trees, dredge wetlands, enter species' habitats, and build on private land or near residential neighborhoods.[458]

Construction of transmission lines within roadway and railroad ROWs would generally be compatible with existing road and railroad operations, provided they are in compliance with all local, state, and federal standards. However, construction may disrupt operations and cause temporary disturbances, including temporary roadway lane closures, reduced shoulders, or the presence of heavy equipment and construction personnel along the roads. The duration of full road closures and single lane closures would be shorter for constructing overhead transmission lines than for underground transmission lines. Projects located underground along roadway corridors could require trenching on the road surface if HDD is not employed, increasing the duration of road closures. Maintenance or emergency repairs of both types of transmission lines may increase traffic on roadways and railways and cause temporary road or lane closures.

There are necessary precautions to take when co-locating transmission lines and railroad tracks. The current running of transmission line conductors produces an electric field that, under the right conditions, can induce a voltage in the railroad circuits running in proximity. Unintentionally inducing a current from power lines to the rails can disrupt the normal operation of railroad signals, shut down a railroad, or damage equipment until the source of the induced current is deenergized or an effective mitigation system is installed.[459] To prevent these scenarios, utilities complete a railroad induction study, identifying and modeling energy sources in the area and locations of all nearby conductors.

State departments of transportation minimize infrastructure that has any physical or visual impacts on roadways. Transmission lines are routed perpendicularly when crossing roadways, complex interchanges are avoided whenever possible, and additional clearance between roadways and overhead lines is included near bridges, which commonly require cranes for maintenance.[460]

Overhead transmission lines are also a potential hazard to aircraft during takeoff and landing. The Federal Aviation Administration, alongside local ordinances, restricts the height of objects adjacent to runways. To improve visibility to pilots, brightly colored lights or other objects are placed on overhead transmission lines to reduce the risk of collision. During the construction phase, large machinery may also be placed close to active airports and adorned with visibility markers. To avoid permanent hazards, utilities can route overhead lines away from an airplane's standard path, install specialized low-profile structures, or place a portion of the line underground.[461] Underground and underwater transmission lines will not conflict with air travel.

5.2.15 Noise, Odor, and Light

Noise is generated during each phase of transmission construction. Initially, for land construction, vegetation in the right-of-way may need to be mowed or cut using mowers, whole tree processors, and/or chainsaws, with wood brush and logs chipped or removed off site. Trucks bring in necessary construction materials and haul away material that cannot be disposed of on-site. Typical construction vehicles include bucket trucks, cranes,

[458] Kurland, A. 2024. Environmental Defense Fund. An Obvious Solution for Building Electric Transmission Faster: Use Railroads and Highways. Environmental Defense Fund. Accessed on November 13, 2024 at: https://blogs.edf.org/climate411/2024/08/05/an-obvious-solution-for-building-electric-transmission-faster-use-railroads-and-highways/.

[459] Cisko, R. 2018. The Effect of Transmission Lines on Railroads. T&D World. Accessed on November 13, 2024 at: https://www.tdworld.com/overhead-distribution/article/20971744/the-effect-of-transmission-lines-on-railroads.

[460] NextGen Highways. Transmission in Highway ROW. Design Considerations. Accessed on November 13, 2024 at: https://nextgenhighways.org/wp-content/uploads/2023/06/1-Transmission-in-Highway-ROW-DesignConsiderations-.pdf.

[461] Public Service Commission of Wisconsin. Environmental Impacts of Transmission Lines. Accessed on November 13, 2024 at: https://psc.wi.gov/Documents/Brochures/Enviromental%20Impacts%20TL.pdf.

backhoes, pulling machines, pole trailers, or dumpsters.[462] These types of equipment and vehicles are often powered by combustion engines, producing noise and odor. Construction is typically done during business or daylight hours, but if work continues at night, vehicles are fitted with lighting to ensure worker safety. Local ordinances usually restrict noise-producing activities to daytime hours. Underwater transmission installations utilize cable-laying vessels which, depending on distance between vessels and human activity, may have similar effects to heavy machinery on land.

Overhead transmission structures are constructed by first using a standard drill rig to bore a hole to the required depth. Blasting, with significant noise and possible odor effects, may be required if bedrock or large rocks are within the required depth. Concrete trucks transfer material to the boreholes for foundation construction. Cranes then erect the towers on the foundations. Finally, large pulleys string the wire between towers. In some cases, wire is connected using implosive connectors, which emit significant noise and light.[463] After the construction is completed, the right-of-way is graded, and agricultural soils are restored.

Underground lines are more complex to install but require equipment with similar effects. Heavy machinery clears and transports material, and in cases of bedrock or large boulders, blasting is required.[464] Underground lines, given their longer construction times and applicability to urban areas, impose more tangible noise, odor, and light effects on communities compared to overhead lines. Even though underwater lines are separated from people, they must be connected to land transmission and require heavy machinery to do so.

Once operational, overhead transmission lines can produce occasional sizzles, crackles, or hissing noises that increase with voltage and water content in the air. These sounds are caused by the discharge of energy known as corona loss that occurs when the electrical field strength on the conductor surface is greater than the "breakdown strength" (the field intensity necessary to start a flow of electric current) of the air surrounding the conductor.[465] This discharge also produces radio noise, a visible glow of light near the conductor, and visible energy loss. During dry conditions, corona noise typically results in continuous noise levels similar to ambient noise conditions in the environment. During wet or high humidity conditions, corona noise levels typically increase. Depending on conditions, wet weather corona noise levels could increase to 60 dBA or higher.[466] Corona noise levels are inconsistent between locations because conductor surface defects, damage, dust, and other inconsistencies influence the corona effect.[467] These issues are not present for underground or underwater transmission lines. They do not use air for insulation and are not subject to changes in precipitation and humidity. Regardless of transmission line design, converter and cooling stations will produce noise.

5.2.16 Human Health and Safety

Construction, operation and maintenance of transmission lines could result in short-term and long-term impacts on human health and safety. In general, construction and operation of transmission lines could create or increase risks related to leaks of hazardous materials, exposure of contaminated soils or groundwater, damage to underground pipelines and utilities, fire hazards, worker safety, EMFs, extreme weather events and natural

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[462] South Dakota Public Utilities Commission. Transmission Line Construction Process. Accessed on November 13, 2024 at: https://puc.sd.gov/commission/dockets/electric/2013/EL13-020/transmissionline.pdf.

[463] *Ibid.*

[464] Public Service Commission of Wisconsin. Underground Electric Transmission Lines. Accessed on November 13, 2024 at: https://psc.wi.gov/Documents/Brochures/Under%20Ground%20Transmission.pdf.

[465] Scientific American. 1999. What Causes the Noise Emitted from High-Voltage Power Lines--Is It Static Discharge, Vibration From the 60-Cycle Field or Something Else Entirely? Accessed on November 13, 2024 at: https://www.scientificamerican.com/article/what-causes-the-noise-emi/.

[466] Aspen Environmental Group. Transmission Line Noise Fact Sheet. Accessed on November 13, 2024 at: https://energizeeastside2.blob.core.windows.net/media/Default/Library/JanuaryOpenHouses/TransmissionLineNoise_factsheet_handout.pdf.

[467] *Ibid.*

disasters, and other general public safety concerns. These risks could be either short-term impacts from construction or maintenance activities or long-term impacts resulting from operation.

Overhead transmission line construction is a dangerous activity. Workers navigate high voltage, heavy machinery, and heights to construct each tower and connect lines. Unsafe contact with transmission lines can result in damage to internal organs, musculoskeletal disorders, neurological damage, severe burns, and death. Researchers have found that operating equipment near energized lines poses the highest risk among the activities done on or near transmission lines. Other tasks with high-risk profiles include energizing lines and equipment prior to placing in service, excavation/trenching, installing foundations, climbing, and operating on aerial lifts.[468]

Underground line construction is less dangerous, though more time consuming, for workers. The invention of horizontal directional drilling has alleviated some cost and time constraints.[469] Underwater construction line workers are confined to cable-laying vessels with large machinery and do not need to enter the water. Similar to underground transmission construction, major concerns working with high voltage, like fire and electrocution, remain.

Installation of transmission cables would also require the transport, handling, use, and storage of hazardous materials and petroleum products, and small amounts of hazardous wastes would be generated as by-products of the transmission cable installation and burial process. Construction workers on all transmission lines risk contact with hazardous materials or waste, and those on land risk exposure to previous contamination in soil or water.

As current moves through a power line, it creates an EMF. The strength of the EMF is proportional to the amount of electric current passing through the power line and decreases with distance. There have long been concerns over the impacts of EMFs on human health, but no study has found evidence of a cause-and-effect relationship between low levels of EMF and negative health effects. Overhead transmission lines emit EMF at 50-60 hertz, which from 300 feet away is similar to everyday exposure.[470] Electric fields of underground cables above the earth are shielded by the cable neutral and other metallic layers, concrete and soil. Magnetic field emitted from underground transmission lines is also weaker than overhead lines because the underground conductors must be placed closer together.[471] All transmission lines must be compliant with the standards outlined in the PSC's Interim Policy on Magnetic Fields of Major Electric Transmission Facilities.[472]

Fallen lines are another safety concern for overhead transmission. Therefore, transmission lines should be designed to de-energize if they fall or make contact with trees. Failure to de-energize could create a dangerous situation. Even if there are no visual or audio cues, a fallen line can carry electricity. If water, metal, a person, a tree, or any conductive object comes into contact with the live wire, electricity will follow the shortest and easiest path to the ground, causing fire, burns, injury, or death.[473] Underground transmission lines are less likely

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[468] The Foundation for Electrical Construction, Inc. 2012. Safety Risk Management for Electrical Transmission and Distribution Line Construction. Accessed on November 13, 2024 at: https://www.greatertorontoeca.org/files/Safety%20Risk%20Management%20for%20Electrical%20Transmission%20ans%20Distribution%20Line%20Construction%20(2012).pdf.

[469] Olsen, R. G. and J. T. Leman. 2022. Overhead or Underground Transmission? That is (Still) the Question. T&D World. Accessed on November 13, 2024 at: https://www.tdworld.com/intelligent-undergrounding/article/21215620/overhead-or-underground-transmission-that-is-still-the-question.

[470] Enloe, S. 2017. Transmission Lines and Your Health. Center for Rural Affairs. Accessed on November 13, 2024 at: https://www.cfra.org/blog/transmission-lines-and-your-health-0.

[471] Olsen, R. G. and J. T. Leman. 2022. Overhead or Underground Transmission? That is (Still) the Question. T&D World. Accessed on November 13, 2024 at: https://www.tdworld.com/intelligent-undergrounding/article/21215620/overhead-or-underground-transmission-that-is-still-the-question.

[472] NYPSC. 1990. Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities. Accessed on December 3, 2024 at: https://dps.ny.gov/system/files/documents/2023/12/26529-and-26559-elec-megnetic-field-stds-sept.11.1990.pdf.

[473] Tennessee Valley Authority. Safety. Accessed on November 13, 2024 at: https://www.tva.com/energy/transmission/safety-around-transmission-lines-equipment.

to be subject to extreme weather and natural disasters, but uninformed individuals may contact lines when digging which could result in similar health effects.

Underwater transmission lines are the most removed from human activity, and thus the safest once installed. The lines are placed deep into the water and only would be contacted by humans in extreme circumstances.

5.2.17 Community Plans

Electric transmission lines in past decades often prioritized direct construction from point A to point B. However, new transmission line projects must account for a range of considerations, including impacts on communities, crops, natural resources, and private property. The installation of overhead transmission lines could lead to both direct and indirect effects on nearby communities and property owners.[474] Transmission lines that share corridors with roads and other routes must carefully assess their impact on surrounding areas to minimize disruption to communities and natural resources. Additional potential community impacts during construction include aesthetic changes and noise from construction activities.

Design considerations should prioritize minimizing visibility impacts and exploring the feasibility of underground transmission lines to reduce long-term effects on communities. Coordination with municipalities is essential to address potential land conflicts and to ensure minimal disruption to both natural and built resources. Both overhead and underground transmission lines could have an impact on existing public utilities and services, such as water supply, telecommunications, buried gas and electric transmission sewer systems, and emergency services. Permanent facilities, including transition stations, converter stations, and substations, must also be strategically placed to reduce community impact while supporting community goals, such as economic development and sustainability.

5.2.18 Community Character

The construction of electric transmission lines and associated infrastructure may have both temporary and permanent impacts on the character of communities along the transmission corridors. Residents and businesses may experience short-term disruptions due to construction activities, including increased noise, traffic congestion, and visual changes during the building phase. As noted previously, there may be disruptions to land use, potentially affecting open spaces and altering the aesthetic characteristics that define a community. These changes may impact local recreation and public use of open spaces.

Construction activities may also lead to changes in population density and demographic composition in some areas, depending on the scale and duration of the construction. Temporary job opportunities may also impact local economies by bringing new residents and businesses to communities. Since population levels and density vary widely across the state, the differing community types summarized in **Section 3.10.2** will each experience unique impacts from the implementation of the RAPID Act. In urban communities, transmission line projects may disrupt neighborhoods and affect transportation and mobility systems, while also enhancing energy reliability and supporting long-term economic development. By contrast, rural communities are more likely to be impacted by aesthetic changes, disruptions to agricultural activities, and the alteration of open spaces and natural landscapes. Overhead utility lines can be detrimental to both urban community character as well as rural community character. Therefore, in both cases, underground transmission lines may offer reduced visual and environmental impacts, preserving community character to a greater extent than overhead lines.

[474] Public Service Commission of Wisconsin. 2012. Environmental Impacts of Transmission Lines. Accessed on November 13, 2024 at: https://www.nrc.gov/docs/ML1209/ML12090A853.pdf.

5.3 Indirect Effects

SEQRA defines a secondary or indirect impact as one which is reasonably foreseeable, will occur at a later time or at a greater distance, and is likely the result of the proposed action. There should be a reasonably close causal relationship between the proposed action and the environmental impacts. Similarly, NEPA regulations at 40 CFR 1508.8 define indirect effects as those effects caused by the action that are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

The proposed action will accelerate upgrades of existing transmission infrastructure and the construction of new transmission. Multiple factors influence transmission development in New York, including basic transmission infrastructure repairs, utility transmission needs, and the State's renewable energy policies (namely CLCPA). By accelerating the State's transition to renewable energy, the proposed action is expected to contribute to the State reducing its reliance on fossil fuels. This shift will curtail climate change-inducing GHG emissions, reduce criteria air pollutants, improve public health, and preserve natural resources. The following section provides a summary of the potential environmental benefits indirectly generated by the proposed action.

5.3.1 Greenhouse Gases

As discussed in **Chapter 3,** GHGs such as CO_2 contribute to the trend of rising average temperatures, changes in precipitation patterns, frequent and severe heatwaves, increased flooding, rising sea levels, and increased threats to public health. By accelerating the phasing out of fossil fuel generation plants, the proposed action is expected to reduce the State's GHG emissions, the benefits of which will extend beyond the State's borders.

5.3.2 Criteria Air Pollutants

Fossil fuel electric generation is a source of criteria air pollutants, including CO_2, carbon monoxide (CO), and heavy metals. The release of sulfur dioxide (SO_2) and NO_x from fossil fuel generated power plants also leads to the formation of particulate matter (PM2.5), ozone, and other acidic compounds in the air. Mercury compounds are another pollutant from fossil fuel energy generation, particularly from coal-powered plants.[475] Criteria air pollutants adversely impact local and regional air quality. These pollutants can negatively affect air quality, visibility, and public health. The proposed action, by accelerating the phasing out of fossil fuel generation plants, will contribute to the reduction of criteria air pollutants like SO_2 and NO_x, especially in disadvantaged communities which have been disproportionately exposed to pollutants resulting from dependence on fossil fuels.

5.3.3 Public Health

Emissions from fossil fuel-based electric generation can negatively affect human health. Exposure to ozone can aggravate lung diseases including asthma, emphysema, and chronic bronchitis, as well as increase the risk of premature mortality from heart or lung disease. Health effects from PM2.5 include aggravated asthma, irregular heartbeat, decreased lung function, nonfatal heart attacks, and premature mortality in those with heart or lung disease.[476] NO_x can increase the risk of respiratory diseases and exacerbate existing respiratory symptoms, especially in children, the elderly, and the poor. Individuals with asthma may experience aggravated symptoms

[475] EIA. Electricity Explained: Electricity and the Environment. Accessed on November 13, 2024 at: https://www.eia.gov/energyexplained/index.php?page=electricity_environment.

[476] EPA. 2024. Particulate Matter (PM) Pollution: What are the harmful effects of PM? Accessed on November 13, 2024 at: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#effects.

when exposed to NO_x.[477] Additionally, exposure to NO_x can cause irreversible structural changes to the lungs. One study estimated health impacts from fossil fuel energy sources at $362 to $886 billion in economic value annually, based on premature mortality, workdays missed, and direct costs to the U.S. healthcare system resulting from PM2.5, NO_x, and SO_2.[478] The same study estimated that the economic value of negative health impacts was equal to approximately $0.14 to $0.31 per kWh.[479] These costs may be even higher if GHG emissions are included.[480] Outdoor PM2.5 pollution from burning fuels in our buildings led to an estimated 1,300 early deaths and roughly $14.4 billion in health impact costs in New York in 2017.[481] The proposed action is expected to contribute to further reductions in such air emissions and related costs and health impacts.

5.3.4 Water, Land and Ecological Resources

Avoided fossil fuel generation should also reduce water demand and improve the health of aquatic ecosystems. Coal combustion in power plants uses significant quantities of water for producing steam and cooling.[482] For natural gas combustion, boilers and combined cycle systems also require water for cooling processes.[483] If process or cooling water comes from a surface water source, water intake structures are required to withdraw the necessary water for the plant's operation. Such intake structures can stress or directly take aquatic organisms held against or passed through intake screens.[484]

Coal-fired generation, natural gas boilers, and natural gas combined cycle systems all release wastewater with excess heat and hazardous chemicals during plant operation. Thermal water discharges elevate water temperatures, which can harm organisms, destroy or degrade habitat, or form barriers to existing migratory routes. Hazardous substances in wastewater can impair water quality, as can deposition of acidic air pollutants (i.e., acid rain).[485]

Coal combustion in traditional legacy baseload generating plants generates significant amounts of solid waste. Much of this waste is disposed of in abandoned mines or landfills, potentially allowing pollutants to leach into ground or surface water. Soil contaminated by pollutant deposition near coal-fired power plants can take years to recover.[486] Acid rain due to emissions of NO_X and SO_2 also impairs the growth of trees or kills them.[487] The proposed action will contribute to accelerated reductions in these types of resource impacts.

5.4 Cumulative Impacts

Section 617.9(b)(5)(iii)(a) of 6 NYCRR requires agencies to consider the "reasonably related short-term and long-term impacts, cumulative impacts, and other associated environmental impacts" of actions on the

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[477] EPA. 2024. Nitrogen Dioxide (NO_2) Pollution: What are the harmful effects of NO_2? Accessed on November 13, 2024 at: https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects.

[478] Machol, B. and S. Rizk. 2013. Economic Value of U.S. Fossil Fuel Electricity Health Impacts. *Environment International*, 52:75-80. Accessed on November 13, 2024 at: https://www.sciencedirect.com/science/article/abs/pii/S0160412012000542.

[479] Gerdes, J. 2013. How Much Do Health Impacts from Fossil Fuel Electricity Cost the U.S. Economy. Forbes. Accessed on November 13, 2024 at: https://www.forbes.com/sites/justingerdes/2013/04/08/how-much-do-health-impacts-from-fossil-fuel-electricity-cost-the-u-s-economy/#34b3aaffc679.

[480] *Ibid.*

[481] Concerned Health Professionals of New York. 2022. Burning Fossil Fuel in Our Buildings Harms the Health of New Yorkers. Accessed on December 5, 2024 at: https://concernedhealthny.org/2022/10/burning-fossil-fuel-in-our-buildings-harms-the-health-of-new-yorkers/

[482] Kenny, J. F., N. L. Barber, S. S. Hutson, K.S. Linsey, J. K. Lovelace and M.A. Maupin. 2009. Estimated Use of Water In the United States in 2005. *U.S. Geological Survey Circular*, 1344:52. Accessed on November 13, 2024 at: http://pubs.usgs.gov/circ/1344/.

[483] Union of Concerned Scientists. 2010. How it Works: Water for Natural Gas. Accessed on November 13, 2024 at: https://www.ucsusa.org/clean-energy/energy-water-use/water-energy-electricity-natural-gas#.WvU59u-Uv0M.

[484] NYSDEC. Aquatic Habitat Protection. Accessed on November 13, 2024 at: http://www.dec.ny.gov/animals/32847.html.

[485] Manjunatha, S. G., K. B. Bobade and M.D. Kudale. Pre-Cooling Technique for a Thermal Discharge from the Coastal Thermal Power Plant. *Procedia Engineering,* 116:358-365. Accessed on November 13, 2024 at: https://www.sciencedirect.com/science/article/pii/S1877705815019542.

[486] EIA. Coal Explained: Coal and the Environment. Accessed on November 13, 2024 at: https://www.eia.gov/energyexplained/?page=coal_environment.

[487] EPA. 2024. Acid Rain. Effects of Acid Rain. Accessed on November 13, 2024 at: https://www.epa.gov/acidrain/effects-acid-rain.

environment and existing natural resources. SEQRA does not expressly define "cumulative impacts;" however, it is useful to note that NEPA regulations at 40 CFR 1508.7 define cumulative impacts as the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

The RAPID Act is part of a broader suite of policies and initiatives designed to respond to multiple challenges facing the State's energy system, including ensuring a timely and just transition to clean energy. In 2019, the State codified its overarching framework for achieving its clean energy goals in the CLCPA. The State's Accelerated Renewable Energy Growth and Community Benefit Act (AREGCBA) built on the CLCPA directives by requiring the State's utilities to identify and construct the upgrades needed to achieve CLCPA goals.

The proposed action is also related to a number of other ongoing State energy initiatives, including, but not limited to: Clean Energy Fund, Reforming the Energy Vision, Clean Energy Standard, 10-Point Action Plan, Accelerated Renewable Energy Growth and Community Benefit Act, and Offshore Wind Master Plan 2.0. These plans and initiatives are discussed in greater detail in **Chapter 1.** In addition to State-level clean energy initiatives, a number of energy-related efforts at the federal level may also interact with the proposed action.

The RAPID Act does not change the clean energy goals the State has established. Under the "no action" alternative, any potential environmental and socioeconomic impacts, including benefits, associated with the proposed action would still occur, but they would be anticipated to occur at a slower pace. It is possible that acceleration of transmission buildup due to the proposed action may generate cumulative impacts, particularly if the transmission buildup is concentrated in specific geographic areas. However, cumulative site-specific impacts of the proposed action are not known at this time and are beyond the scope of this GEIS. This GEIS provides a generic description of the potential environmental impacts of the proposed action. The use of the Uniform Codes and Standards (USCs) together with any necessary site-specific siting permit terms and conditions imposed in final siting permits will identify, evaluate, mitigate, and minimize potential site-specific impacts associated with a particular project.

By considering cumulative impacts, the intent of SEQRA is to identify actions that may be insignificant by themselves, but which can degrade environmental resources over time when considered together. These considerations of potential cumulative effects of accelerated transmission development include:

- Accelerated reduction in the State's GHG emissions and air pollution originating from fossil fuel-based energy generation;
- Accelerated improvements in the electric grid's reliability and resiliency; and
- Potential cumulative state-wide negative impacts, which are not identifiable at this time. As discussed further in **Chapter 6**, a number of regulations, policies, and best practices serve as measures that will mitigate adverse impacts that may arise from activities undertaken in response to the proposed action.

CHAPTER 6 | Regulatory Framework and Mitigation of Potential Adverse Impacts

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(iv) and 617.11(d)(5) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter describes the variety of measures available to minimize or avoid, to the maximum extent practicable (incorporating all practicable mitigation measures), potentially adverse environmental impacts that may result from implementation of the proposed action in New York State (the State).

Specifically, this chapter discusses mitigation in three parts:

- **Section 6.1** introduces key federal and State laws that may apply during the construction and operation of a specific project;
- **Section 6.2** describes the Office of Renewable Energy Siting and Electric Transmission's (ORES's) uniform standards and conditions (USCs) for the siting, design, construction, and operation of major electric transmission facilities. The USCs are designed to avoid, minimize, or mitigate, to the maximum extent practicable, any potential significant adverse environmental impacts that are common to the construction and operation of such facilities; and
- **Section 6.3** describes ORES's authority to establish site-specific conditions to address site-specific and project-specific impacts, associated with a specific major electric transmission facility, that are not otherwise addressed by the USCs.

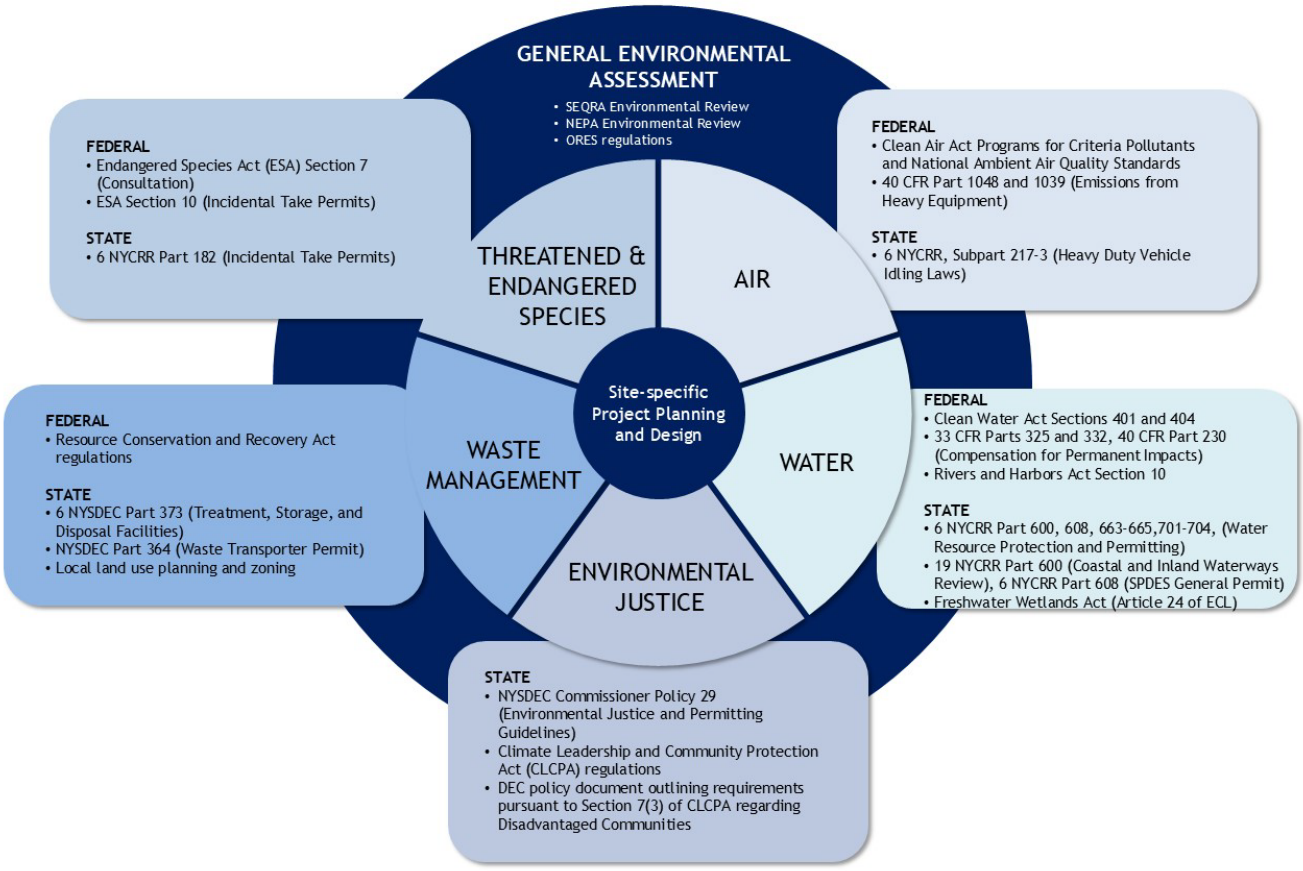
This chapter is not intended to provide an exhaustive list of potentially applicable laws or mitigation measures, but rather a general overview of the key statutes and regulations and means by which adverse environmental impacts may be mitigated for a specific project or groups of similar projects. Note that the proposed action would not change the portfolio of projects expected to be completed in the State; instead, the proposed action may accelerate the pace of major electric transmission facility permit approvals.

6.1 Potentially Applicable Federal and State Regulations

Transmission and renewable energy developers must comply with existing federal and State statutes, which are designed specifically to protect human health and the environment from activities that could otherwise result in significant adverse impacts. Developers must also comply with existing federal regulations. With respect to State regulations, the proposed RAPID Act regulations implement the applicable State laws for transmission and renewable energy projects subject to Public Service Law (PSL) article VIII (Article VIII) and thereby replace most applicable State regulations and permits for those projects.

The following sections discuss potentially applicable federal and State laws for key resource areas that may be affected by the proposed action. **Figure 6-1** below summarizes potentially applicable permits and laws, by resource area and type of review. Compliance with these laws will establish regulated environmental conditions, upon which any site-specific mitigation measures, if needed, can be implemented.

Figure 6-1. Applicable Permits and Regulations



6.1.1 Air Resources

A number of federal and State laws and regulations address air pollution, including hazardous air pollutants that may occur as the result of constructing, operating, and maintaining transmission facilities. This section provides an overview of the key laws and regulations designed to mitigate, control and reduce air pollutants.

The primary federal statute governing air quality and air pollution is the Clean Air Act (CAA).[488] Air quality is defined by ambient air concentrations of specific pollutants that the U.S. Environmental Protection Agency (EPA) has identified as potentially harmful to public health and the environment.[489] Specifically, EPA has defined primary (and in some cases secondary) standards for six "criteria" pollutants, including: (1) particulate matter (PM10 and PM2.5); (2) carbon monoxide (CO); (3) sulfur dioxide (SO_2); (4) nitrogen dioxide (NO_2); (5) lead (Pb); and (6) ozone. National primary ambient air quality standards define levels of air quality that EPA has determined necessary to provide an adequate margin of safety to protect public health, including the health of sensitive populations such as children and the elderly. National secondary ambient air quality standards define levels necessary to protect the public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

[488] 42 U.S.C. 7401 et seq., amended in 1977 and 1990.

[489] The surrounding atmosphere, usually the outside air, as it exists around people, plants and structures.

Areas that do not meet National Ambient Air Quality Standards (NAAQS) – as set forth in the CAA – for specific criteria pollutants are designated as being in "nonattainment" for specific criteria pollutant standard(s). For some criteria pollutants, nonattainment status is further defined by the extent to which the applicable standard is exceeded. For example, there are five classifications of ozone nonattainment status (marginal, moderate, serious, severe, and extreme) and two classifications of carbon dioxide (CO_2) and PM10 nonattainment status (moderate and serious). The remaining criteria pollutants have designations of either attainment, nonattainment, or unclassifiable. Areas re-designated from nonattainment to attainment are commonly referred to as maintenance areas. These areas are in attainment but subject to an EPA-approved maintenance plan for a specific pollutant, to ensure continued compliance with the standard. Most air quality control regions in the State are in attainment with NAAQS. However, as of 2018 two regions are designated 8-hour ozone (2008) NAAQS nonattainment areas: the upstate county of Chautauqua and downstate counties including Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, and Westchester.[490] All of the State is considered part of the Ozone Transport Region (OTR) and is required at a minimum to implement measures required in moderate ozone nonattainment areas.

Construction of transmission facilities may involve the use of heavy construction equipment, resulting in emissions of diesel particulate matter, nitrogen oxide (NO_X), reactive organic gases, and greenhouse gases. EPA regulates emissions from heavy equipment through 40 CFR part 1048 and 40 CFR part 1039. Further, State regulations at 6 NYCRR subpart 217-3 address heavy duty vehicles that may be traveling to or working on construction sites by prohibiting idling for more than five minutes at a time. This idling restriction is aimed at reducing air pollution, noise, and fuel use.

6.1.2 Water Resources and Wetlands

The primary federal statute governing water quality and water resources is the Clean Water Act (CWA). Any new infrastructure, including infrastructure associated with development of transmission facilities, that either crosses or occurs near navigable waters may trigger federal review and permitting requirements under the CWA.[491]

Projects for which construction activities occur near navigable waters or could otherwise obstruct or alter navigable waters must obtain a permit from the U.S. Army Corps of Engineers (USACE) under Section 10 of the Rivers and Harbors Act. As part of such processes, project developers are required to propose and implement measures to avoid impacts to wetlands, streams, and other regulated water resources in accordance with the environmental criteria from CWA section 404(b)(1). Renewable energy projects in the State are required to obtain CWA section 401 Water Quality Certifications from the ORES as a prerequisite to the USACE permit.

In cases where impacts are unavoidable, 33 CFR Parts 325 and 332 and 40 CFR Part 230 govern the framework under which developers may be able to compensate for (or offset) permanent impacts. EPA and USACE require compensatory mitigation to replace the loss of wetland, stream, and other aquatic resource functions from unavoidable impacts, which is usually accomplished through prior restoration or enhancement projects ("mitigation banks"), fee payments, or new restoration, establishment, enhancement, or preservation activities required in the permitting process.

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[490] EPA. Greenbook. Nonattainment Status for Each County by Year for Criteria Pollutants as of July 02, 2014. Accessed on November 18, 2024 at: https://www3.epa.gov/airquality/greenbook/anayo_ny.html.

[491] CWA Section 404(f) provides exemptions for some activities associated with ongoing farming, ranching, and forestry activities that do not represent new uses of water that result in flow reduction.

Under CWA section 401, projects applying for any federal licenses or permits must obtain New York State certification that any discharges into navigable waters will comply with New York State water quality standards. In most cases, the New York State Department of Environmental Conservation (NYSDEC) reviews and issues state certifications. However, for projects subject to Article VIII, ORES will review and issue the State certification.

Regulations at the State level provide further protection for the State's water resources. For example, in general, projects whose activities disturb stream banks, impound water, require the construction (or reconstruction or repair) of docks or mooring, or excavate and fill navigable waters or wetlands are required to obtain permits from NYSDEC under 6 NYCRR part 608. For projects subject to Article VIII, project developers receive their State permit in the form of an Article VIII siting permit.

Activities occurring in coastal areas are overseen by the State's Coastal and Inland Waterways Program, which is responsible for implementing the Federal Coastal Zone Management Act (FCZMA) and state-level coastal regulations under 19 NYCRR part 600. While neither program requires permits or licenses for activities occurring in coastal areas, proposed activities must be consistent with the State's coastal policies that guide the appropriate use and protection of the State's coasts and waterways. An assessment of the potential impacts of such activities is required as part of project planning. Such assessments are designed to support economic development, but in a manner that avoids or minimizes, to the maximum extent practicable, loss or degradation of the unique natural and cultural resources that exist along the State's coastline. These include marine resources and wildlife, open space, shoreline erosion, and scenic beauty through the consideration of Significant Coastal Fish and Wildlife Habitats and Scenic Areas of Statewide Significance designations. ORES conducts the State-level coastal consistency review for project subject to Article VIII. Projects that require federal permits or authorizations, such as USACE Permits, may also require federal consistency review by the New York Department of State if the proposed activity would take place in or affect the coastal area.

The State Pollutant Discharge Elimination System (SPDES) program, created by article 17 of the Environmental Conservation Law, is designed to eliminate the pollution of New York waters and to maintain the highest quality of water possible, consistent with public health, public enjoyment of resources, protection of fish and wildlife, and industrial development in the State. New York's SPDES program has been approved by the EPA for the control of surface wastewater and stormwater discharges in accordance with the CWA; however, the SPDES program is broader in scope than that required by the CWA as it controls point source discharges to groundwaters as well as surface waters.[492]

Before commencing construction activity, the owner or operator of a construction project that will involve soil disturbance of one or more acres must also obtain coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, informally known as the Construction General Permit (CGP).

The Freshwater Wetlands Act, article 24 of the Environmental Conservation Law, provides NYSDEC with the authority to regulate freshwater wetlands in the State. In January 2022, the State amended Environmental Conservation Law article 24. NYSDEC is currently in the rulemaking process to update its regulations to reflect the implemented amendments.[493] Among other changes, the current NYS Freshwater Wetlands Maps will no longer limit NYSDEC regulatory jurisdiction to wetlands depicted on those maps; instead, such maps will

[492] NYSDEC. State Pollutant and Discharge Elimination System (SPDES) Permit Program. Accessed on December 4, 2024 at: https://dec.ny.gov/regulatory/permits-licenses/wastewater-stormwater-water-withdrawal/spdes-permit-program.

[493] NYSDEC. Freshwater Wetlands Program. Accessed on November 19, 2024 at: https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program.

become informational. Currently, any construction activity, including the construction of transmission infrastructure, on wetlands of size 12.4 acres or more would need to obtain the necessary permit from DEC.[494] Effective January 1, 2025, the default size threshold of regulated wetlands will decrease from 12.4 acres to 7.4 acres.[495] Smaller wetlands may be protected if NYSDEC commissioner determines they have "unusual importance" in providing one or more of the functions described in Article 24. In order to obtain a Freshwater Wetlands Act Permit, a project must meet the permit standards in 6 NYCRR part 663, Freshwater Wetlands Permit Requirement Regulations, and be consistent with the public health, safety, and welfare.[496] The project must also avoid impacts to wetlands, and if unavoidable, must minimize those impacts. Project sponsors may then use mitigation to offset residual project impacts in the wetland so that it meets the balancing standards set forth in the regulations. Part 664 of 6 NYCRR, to be renamed "Freshwater Wetlands Jurisdiction and Classification," contains the criteria for classifying wetlands as Class I, II, III, or IV, according to their ability to perform wetland functions and provide wetland benefits. The procedures for how local governments may assume the permitting authority for Article 24 within their locality is set forth at 6 NYCRR part 665, identifying the compatibility of 43 categories of activities with the protection of wetlands and their benefits.[497]

Pursuant to the Tidal Wetlands Act, article 25 of the Environmental Conservation Law, NYSDEC also administers the Tidal Wetlands Regulatory Program designed to prevent the despoliation and destruction of tidal wetlands.[498] The tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis, including but not exclusively within the salt wedge. Under the Tidal Wetlands Act, NYSDEC administers a permit program regulating activities in tidal wetlands and their adjacent areas. The adjacent areas extend up to 300 feet inland from the wetland boundary (up to 150 feet inland within New York City). Official tidal wetlands maps showing the exact locations of New York's regulated wetlands are on file in NYSDEC regional offices in Regions 1, 2, and 3, and in the County Clerks' Offices of Nassau, Suffolk, Bronx, Kings, New York, Queens, Richmond, Rockland, and Westchester Counties. They are also available at local assessing agencies in these areas. Regulation is based on the Tidal Wetlands Land Use Regulations (6 NYCRR part 661). The wetland categories used in these regulations are identified by the presence of a tide and the types of vegetation present. The categories of wetlands and the restrictions placed on activities in and around them are defined in detail in 6 NYCRR part 661.

For projects subject to Article VIII, the current regulations at 16 NYCRR part 1100 provide the substantive regulatory requirements applicable to renewable energy projects implementing the State freshwater wetlands laws, and project developers receive their State freshwater wetlands permit from ORES in the form of an Article VIII siting permit. The proposed regulations will implement both the State Freshwater Wetlands Act and Tidal Wetlands Act for transmission and renewable energy projects subject to Article VIII, and project developers will receive any necessary freshwater or tidal wetlands permits from ORES in the form of an Article VIII siting permit. As a result of the changes to the State Freshwater Wetlands Act described above, the substantive provisions of the proposed RAPID Act regulations applicable to freshwater wetlands have been revised to bring them into conformity with NYSDEC's new freshwater wetlands program.

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[494] NYSDEC. Freshwater Wetlands Permits. Accessed on November 19, 2024 at: https://dec.ny.gov/regulatory/permits-licenses/waterways-coastlines-wetlands/freshwater-wetlands#Determine.

[495] NYSDEC. Freshwater Wetlands Program. Accessed on November 19, 2024 at: https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program.

[496] Ibid.

[497] Ibid.

[498] NYSDEC. Tidal Wetlands Program. Accessed on December 3 at: https://dec.ny.gov/regulatory/permits-licenses/waterways-coastlines-wetlands/tidal-wetlands-permit-program.

6.1.3 Waste Management

Construction and operation of transmission facilities may involve generation and disposal of federal- and state-regulated wastes. The primary federal waste management regulation is the Resource Conservation and Recovery Act (RCRA), which regulates the transport and management of solid and hazardous wastes. EPA delegated authority to the State to implement and enforce hazardous waste regulations under RCRA. As an authorized agency, NYSDEC must enact State laws and regulations that are at least as stringent as federal laws and regulations.

Through 6 NYCRR part 373 Hazardous Waste Permits, NYSDEC ensures that environmentally protective design and operational standards are maintained at facilities that treat, store, or dispose of hazardous waste materials.[499] Anyone that transports regulated waste on the roads of the State must have a New York State Part 364 waste transporter permit if the waste originates or is disposed in the state.[500] NYSDEC has developed various regulations, policy documents, technical and administrative guidance memorandums (TAGMs), and enforcement discretion letters to help the regulated community understand which regulations are in effect in New York State and how to comply with the State statutory and regulatory requirements for hazardous waste management.

6.1.4 Public Service Law

The RAPID Act creates a new Article VIII of the PSL, which includes the requirements related to ORES's review of applications and the issuance of siting permits for both major renewable energy generation and electric transmission facilities. Specifically, the RAPID Act consolidates ORES's generation siting process established in the former Executive Law section 94-c and the PSC's transmission siting process established in PSL article VII into the newly created Article VIII regime. This represents a departure from the previous Article VII, where the PSC issued a certificate of environmental compatibility and public need for a major utility transmission facility. With regard to renewable energy generation facilities, the new Article VIII largely mirrors the former 94-c process but introduces additional protections for farmland.

While the RAPID Act eliminates the PSC's direct role in the issuance of permits for siting transmission lines, the PSC must still approve ORES's permitting regulations. The new Article VIII requires the PSC to approve the uniform standards and conditions that govern the siting, design, construction, and operation of transmission lines and any changes to such conditions for generation facilities.

6.1.5 Environmental Justice and Disadvantaged Communities

Environmental justice (EJ) communities, characterized by low-income and minority residents, have historically been overburdened by a high density of air pollution sources, particularly those associated with transportation and energy. To minimize disproportionate environmental impacts on EJ communities, community involvement is required as part of energy siting and permitting review processes and in the development of transportation projects. Commissioner Policy 29 (CP-29) provides guidance for incorporating environmental justice concerns into NYSDEC's environmental permit review process.[501] This policy amends the NYSDEC environmental permit process by identifying potential environmental justice areas; providing information on environmental justice to applicants with proposed projects in those communities; enhancing public participation requirements for proposed projects in those communities; establishing requirements for projects in potential environmental justice areas with the potential for at least one significant adverse environmental impact; and providing

[499] NYSDEC. Hazardous Waste Management. Accessed on November 19, 2024 at: http://www.dec.ny.gov/chemical/8486.html.

[500] NYSDEC. Waste Transporters. Accessed on November 19, 2024 at: https://www.dec.ny.gov/chemical/8483.html.

[501] NYSDEC. 2018. EJ Related Policy and Regulations. Accessed on November 19, 2024 at: http://www.dec.ny.gov/public/333.html.

alternative dispute resolution opportunities to allow communities and project sponsors to resolve issues of concern to the community. For projects subject to Article VIII, potential impacts to EJ communities are reviewed by ORES as part of the Article VIII siting permit review process.

In 2023, the Climate Justice Working Group (CJWG), established by the CLCPA, developed the criteria to identify disadvantaged communities (DACs) to ensure that frontline and otherwise underserved communities benefit from the State's historic transition to cleaner, greener sources of energy, reduced pollution and cleaner air, and economic opportunities. DACs are broadly defined as "communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- and moderate- income households."[502] When issuing permits, licenses, and other administrative approvals and decisions, section 7(3) of CLCPA requires that all State agencies, offices, authorities, and divisions shall not disproportionately burden DACs and shall prioritize reductions of greenhouse gas emissions and co-pollutants in DACs. In 2024, NYSDEC issued a policy document outlining the requirements for analyses developed pursuant to section 7(3) of CLCPA. The policy document provides guidance for NYSDEC staff when reviewing permit applications associated with sources and activities in or likely to affect a disadvantaged community that result in greenhouse gas or co-pollutant emissions regulated pursuant to Article 75 of the Environmental Conservation Law.[503] For projects subject to Article VIII, potential impacts to disadvantaged communities will be reviewed by ORES pursuant to the proposed RAPID Act regulations.

6.1.6 Threatened and Endangered Species

Federal regulations on threatened and endangered species in the United States are primarily governed by the Endangered Species Act (ESA) of 1973. Section 7 of the ESA requires federal agencies to ensure that actions they undertake, authorize, or fund are not likely to jeopardize threatened or endangered species or adversely modify designated critical habitats of listed species. To satisfy this mandate, Section 7 generally requires action agencies to consult with the U.S. Fish and Wildlife Service (FWS) or the U.S. National Marine Fisheries Service (NMFS) when their proposed actions may affect listed species or critical habitat. Actions subject to Section 7 may include infrastructure projects that are undertaken by action agencies or by nonfederal entities with federal authorization or funding.[504] In addition, when an animal or plant is proposed for listing, Section 4 of the ESA also requires the FWS or the NMFS to designate critical habitat for the species based on the best available scientific and commercial information on what an animal or plant species needs to survive, reproduce, and recover. Section 9 of the ESA prohibits the import, export, or take of endangered species of fish or wildlife. Prohibitions identified in Section 9 of the ESA do not automatically apply to threatened species. Section 4(d) of the ESA directs agencies to issue regulations necessary and advisable to conserve species listed as threatened.

Section 10 of the ESA provides exceptions for the "take" of listed plant and animal species resulting from activities that would otherwise be considered unlawful and prohibited.[505] With some exceptions, the ESA prohibits take resulting from activities affecting these protected species and their habitats unless authorized by a

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[502] NYSDEC. DEC Program Policy - Permitting And Disadvantaged Communities Under The Climate Leadership And Community Protection Act. Accessed on November 19, 2024 at: https://dec.ny.gov/regulatory/permits-licenses/notable-projects-documentation/permitting-disadvantages-communities-under-climate-leadership-and-community-protection-act#:~:text=Disadvantaged%20communities%20are%20defined%20in,%2D%20and%20moderate%2D%20income%20households.

[503] NYSDEC. Permitting and Disadvantaged Communities. Accessed on November 19, 2024 at: https://dec.ny.gov/sites/default/files/2024-05/prgrmpolicy24dash1.pdf.

[504] Congressional Research Service. Endangered Species Act (ESA) Section 7. Accessed on December 4, 2024 at: https://crsreports.congress.gov/product/pdf/R/R4686.

[505] U.S. Fish and Wildlife Service. Permits for Native Endangered and Threatened Species. Accessed on December 4, 2024 at: https://www.fws.gov/library/collections/permits-native-endangered-and-threatened-species.

permit from the FWS or the NMFS. There are three types of permits that allow for the take of endangered or threatened species: incidental take permits, enhancement of survival permits, and recovery and interstate commerce permits. Incidental take permits may be sought when a non-federal entity believes their otherwise lawful activities may result in take of endangered or threatened animal species. A habitat conservation plan must accompany an application for an incidental take permit. Among other requirements, the habitat conservation plan supporting the application ensures that the impacts of the authorized incidental take are adequately minimized and mitigated.

In addition to federal laws, the State has its own regulations to protect threatened and endangered species, as well as their habitats, during development activities including construction of transmission infrastructure. NYSDEC maintains its own list of endangered, threatened, and special concern species according to the criteria specified under sections 182.2(g), (h), and (i) of 6 NYCRR, respectively.[506] NYSDEC utilizes its authority under SEQRA and other permitting authorities to assess potential environmental impacts and make recommendations to project proponents on how to avoid or reduce those impacts. The same approach is followed for the protection of endangered and threatened animals (listed species). However, when a project proponent cannot fully avoid adverse impacts to listed species, the regulations regarding issuing a permit under 6 NYCRR part 182 come into play. In order to trigger the permit requirement, a proposed activity must either be likely to result in the take of individuals of a listed animal or involve an adverse modification of occupied habitat, which is defined in the regulations as the geographic area in which a protected species has been determined by the department to exhibit one or more essential behaviors. Taking is defined in the regulations to include not only the direct killing of listed species, but also actions that are expected to result in harm to individuals, including adverse impacts to habitats occupied by listed species. The permit required under existing law (ECL Section 11-0535) and regulations (part 182) for activities that may result in the take of endangered or threatened species is an incidental take permit. These regulations refer to the permit as an incidental take permit because the take authorized by the permit is incidental to (i.e., not the primary purpose of) an otherwise lawful activity. The permit requirements under these regulations only apply to animal species listed as endangered or threatened as defined in part 182.

For large-scale renewable energy projects, including large-scale transmission infrastructure projects, subject to Article VIII, the proposed RAPID Act regulations replace part 182, and project developers receive any necessary incidental take permit as part of their Article VIII siting permit.

6.1.7 Additional Substantive Federal, State and Local Regulations

ORES must apply all substantive State and local laws applicable to transmission projects. ORES has the authority to waive substantive local laws that are unreasonably burdensome in light of the CLCPA targets and the environmental benefits and the public need for the proposed major electric transmission facility. As noted above, the ORES regulations are, in effect, the State regulations implementing State laws such as the Freshwater Wetlands Act, the Tidal Wetlands Act, the Threatened and Endangered Species Act, the Protection of Waters Act, and other State resource protection statutes.

Table 6-1 provides a more extensive list of potentially applicable statutes, permits, and review. Site-specific characteristics and project-specific details will ultimately determine the statutes that will apply to each potential development. Note that ORES is the sole State-level permitting authority under Article VIII, except for the federally-delegated or approved State air pollution and water pollution control permits, for which NYSDEC

[506] NYSDEC. List of Endangered, Threatened and Special Concern Fish and Wildlife Species of New York State. Accessed on December 4, 2024 at: https://dec.ny.gov/nature/animals-fish-plants/biodiversity-species-conservation/endangered-species/list.

remains the State permitting authority. The Article VIII regulations otherwise replace the State regulations referenced here.

Table 6-1. Potentially Applicable Regulations, Permits, and Review Processes

Resource Area	Level	Regulation, Permit, Or Review	Relevant Laws And Statutory Authority
Air	Federal	Clean Air Act (CAA) Programs for Criteria Pollutants and National Ambient Air Quality Standards (NAAQS)	USC 7401
	Federal	Regulations for Emissions from Heavy Equipment	40 CFR Part 1048; 40 CFR Part 1039
	State	Heavy Duty Vehicle Idling Laws	6 NYCRR Part 217-3
Water	Federal	CWA Section 404 Permit (discharge of dredged or fill material)	CWA Section 404
	Federal	Framework to compensate for permanent impacts	33 CFR Parts 325 and 332, 40 CFR Part 230
	Federal	Office of Renewable Energy Siting (ORES) Water Quality Certifications	CWA Section 401
	Federal	Construction near navigable waters USACE permit	Rivers and Harbors Act Section 10
	State	NYSDEC State Water Quality Certification	CWA Section 401
	State	SPDES General Permit	6 NYCRR Part 608
	State	NY Coastal and Inland Waterways Program Consistency Review	19 NYCRR Part 600 (New York Waterfront Revitalization and Coastal Resources Act)
	State	New York State water quality standards	6 NYCRR Parts 701-704
	State	NYSDEC Freshwater Wetlands Act Permits	6 NYCRR Part 663
	State	NYSDEC Freshwater Wetlands Jurisdiction and Classification	6 NYCRR Part 664
	State	Local Government Implementation of the Freshwater Wetlands Act	6 NYCRR Part 665
Waste Management	Federal	Resource Conservation and Recovery Act	42 USC Section 6901
	State	NYSDEC Hazardous Waste Management Permit	6 NYCRR, Part 373
	State	NYSDEC Waste Transporter Permit	6 NYCRR, Part 364
	Local	Local Land Use Planning and Zoning	Various
Environmental Justice	State	Climate Leadership and Community Protection Act (CLCPA) regulations	Section 7(3) of CLCPA, Environmental Conservation Law Article 73
	State	NYSDEC Environmental Justice and Permitting guidelines	Commissioner Policy (CP)-29
Threatened and Endangered Species	Federal	Endangered Species Act (ESA) Section 7 Consultation	ESA Section 7
	Federal	Incidental Take Permits	ESA Section 10
	State	Incidental Take Permits	6 NYCRR Part 182

6.2 Proposed Uniform Standards and Conditions

The RAPID Act transferred ORES and its existing authority to the Department of Public Service (DPS) and provided it with additional responsibilities for the review and permitting of major electric transmission facilities pursuant to Public Service Law (PSL) article VIII. The proposed RAPID Act regulations, Chapter XI of 16 NYCRR (Part 1100), establish procedural and substantive requirements for permit applications for renewable energy facilities reviewed by ORES, which includes major renewable energy generation facilities (Part 1101) and major electric transmission facilities (Part 1102). To streamline the review process and clarify application requirements, ORES has revised the current renewable energy generation regulations at Part 1100 to incorporate process improvements and lessons learned based on experiences in implementing the former 19 NYCRR part 900 and PSL Article VII. Substantive revisions include new application exhibit requirements pertaining to noise/vibration and visual impacts.[507]

The RAPID Act also required ORES to establish USCs for transmission facilities in addition to the previously established USCs for generation facilities. These USCs are intended to avoid, minimize, and mitigate, to the maximum extent practicable, adverse environmental impacts that are common to major transmission facilities. Subsection 1102-3 of 16 NYCRR discusses the USCs designed to mitigate adverse environmental impacts from construction, maintenance, and operation of transmission facilities. These USCs are derived from the substantive standards that were developed through Article VII, with some standards borrowed from the 94-c generation regulations. As these standards have been previously vetted, ORES can be assured that the USCs will avoid, minimize, and mitigate, to the maximum extent practicable, those environmental impacts that are common to major electric transmission facilities.

The proposed USCs designed to avoid, minimize, and mitigate environmental impacts to the maximum extent practicable include, but are not limited to:

Geology and Soil

- Permanent erosion control fabric or netting used to stabilize soils prior to establishment of vegetative cover or other permanent measures is required to be one hundred (100) percent biodegradable, non-photodegradable, natural product, excluding silt fence and geotextile used for road construction. Use of hay for erosion control or other construction-related purposes is prohibited.

Land Use

- The permittee is required to retain an independent, third-party environmental monitor(s) to oversee compliance with environmental commitments and siting permit requirements, and the environmental monitor(s) shall perform regular site inspections of construction work sites and, in consultation with ORES, issue regular reporting and compliance audits, in accordance with applicable permit requirements.

- The permittee is required to implement an approved Visual Resources Management Plan (VRMP) and ensure consistency between the VRMP, the final design drawings, and construction and vegetation management measures

- Blasting shall be designed and controlled to meet the limits for ground vibration set forth in United States Bureau of Mines Report of Investigation 8507 Figure B-1 and air overpressure shall be under the

[507] Most revisions in section 1101 of the regulations governing major renewable energy facility siting are a consequence of conforming these regulations governing generation facility permitting with the changes implemented in Title 16 section 1102 for the new regulations governing transmission facility permitting.

limits set forth in the Conclusion Section in United States Bureau of Mines Report of Investigation 8485 to protect structures from damage.

- Tree and vegetation clearing is limited to the minimum necessary for facility construction and operation, and as detailed on approved final construction plans.
- Construction should not directly disturb areas outside the construction limits shown on the design drawings.
- Any debris or excess construction materials is required to be removed to a facility or location legally authorized to receive such material.
- The permittee is required to report any damage to public or private property, damage to equipment, or damage to any sensitive resource incurred as a result of project activities.

Surface Water and Groundwater Resources

- The permittee is required to hire a qualified third party to perform pre- and post-construction testing of the potability of water wells within stipulated distances of construction disturbance before commencement of construction and after completion of construction.

Wetlands

- Except as otherwise allowed in the permit, no construction activities shall occur within any wetlands, including tidal and freshwater wetlands, regulated adjacent areas, waterbodies, and streams. No construction materials, equipment, or vehicles shall be allowed to enter upon any such waterbodies, and no in-water sidecasting shall occur. The permittee is required to implement specific procedures for approved construction within such waterbodies.
- The permittee is required to take all necessary precautions to preclude contamination of any wetland, stream, or other waterbody by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate, washings from transit mix trucks, mixers, or other devices, or any other environmentally deleterious materials associated with the project.

Coastal Resources

- For projects located within the Marine and Coastal District, to avoid and minimize impacts to NYS threatened or endangered marine species, the permittee shall implement the following conditions during construction and operation: (i)
    - Sightings of North Atlantic Right whales must be reported to NOAA, NYSDEC, and ORES as soon as possible, but no later than within 24 hours of the sighting;
    - The permittee is required to comply with all applicable time of year restrictions required by ORES in consultation with NYSDEC, unless otherwise approved through implementation of an approved (i) avoidance and minimization plan for NYS threatened or endangered species and/or (ii) a Net Conservation Benefit Plan (NCBP) prepared in consultation with NYSDEC and approved by ORES for NYS threatened or endangered species.
- When project activities will occur in aquatic environments, an additional environmental monitor(s) is required for the duration of all in-water work if such work is undertaken simultaneously with onshore and/or interconnection construction activities (aquatic environmental monitor). The same inspector shall not be assigned to both in-water and on-land activities, simultaneously.

Air

- To minimize air emissions during construction, the permittee is required to implement dust control procedures, use construction equipment powered by electric motors or ultra-low sulfur diesel when feasible, dispose of or reuse cleared vegetation to minimize GHG emissions, and prohibit contractors from leaving generators and diesel engines idling when not actively being used.

- To minimize air emissions during construction, the permittee is required to prohibit contractors from leaving generators idling when electricity is not needed and from leaving diesel engines idling when equipment is not actively being used.

Plants and Animals

- For facilities that would cause a permanent adverse impact on the State's threatened or endangered species or its habitat, the permittee is required to prepare a NCBP that is approved by ORES.

- The permittee is required to implement specific measures to mitigate de minimis as well as more than de minimis impacts on the State's threatened or endangered grassland birds, bats, reptiles, amphibians, bald eagles, and marine species.

- During construction and restoration of the facilities, the permittee is required to maintain a record of all observations of the State's threatened or endangered species.

Agricultural Resources

- When project activities will occur within land used in agricultural production, the permittee is required to retain an independent, third-party agriculture-specific environmental monitor.

- Where blasting will occur in agricultural areas, the permittee is required to ensure that: in agricultural areas of till over bedrock, matting or controlled blasting shall be used to limit the dispersion of blast rock fragments; all blasted rock not used as backfill shall be removed from croplands, haylands, and improved pastures; and the till and topsoil shall be returned in sequence to restore the soil profile.

Historic and Archeological Resources

- The permittee is required to ensure that no construction site preparation, clearing, or other disturbance is undertaken in previously undisturbed areas where archeological surveys have not been completed until such time as ORES, in consultation with the Office of Parks, Recreation and Historic Preservation, has reviewed the results of any additional archeological and historic resource surveys that are required, and has provided final effect or impact determination letter(s).

- The permittee is required to implement the approved Cultural Resources Avoidance, Minimization, and Mitigation Plan (CRAMMP) and ensure consistency between the CRAMMP, the approved Site Avoidance Plans, and the project location, design, and construction and vegetation management measures specified in the Environmental Management & Construction Plan.

Noise, Odor, and Light

- Noise limits are established for converter stations not located in cities with a population over one million.

- For any converter station, substation, or switchyard located in cities with a population over one million, the substantive provisions of that city's local laws and regulations on noise and vibration shall apply.

- For converter stations including any adjoining substation not located in cities with a population over one million: a maximum noise limit of forty-two (42) weighted-decibel equivalent continuous level (dBA Leq) (1-hour) maximum equivalent continuous average sound level outside of any type 1 sensitive sound receptors. A maximum noise limit of fifty-five (55) dBA Leq (1-hour) outside of any type 5 sensitive sound receptors. No penalties for prominent tones will be added in this assessment.

Water, Land and Ecological Resources

- All hazardous chemicals and waste are required to be managed appropriately. This includes securing waste in a locked and controlled area, equipping construction vehicles with spill kits, inspecting for leaks daily, stopping leaks and cleaning up immediately, training field personnel and contractors in spill response procedures, keeping local fire department and emergency management teams apprised of on-site hazardous chemicals and waste, and reporting spillage to NYSDEC's Spill Hotline within two hours of discovery in accordance with the NYSDEC Spill Reporting and Initial Notification Requirements Technical Field Guidance.

The permittee is required to implement any impact avoidance, minimization, and/or mitigation measures identified in the application exhibits, compliance filings, and/or contained in a specific plan required under 16 NYCRR part 1102.

6.3 Site-Specific Conditions

The RAPID Act directs ORES during its review of an application for a major electric transmission facility to identify those site-specific or project-specific adverse impacts, if any, that may be caused or contributed to by a specific proposed facility that are not addressed by the USCs. ORES is further directed to develop, in consultation with the NYSDEC, site-specific conditions (SSCs) to address those impacts, taking into account the CLCPA targets, the environmental benefits of the facility, and the public need for the facility. While the RAPID Act expressly exempts the review of specific applications from SEQRA, the project-specific permit application review conducted under Article VIII is at least as comprehensive as SEQRA. Accordingly, ORES will conduct a comprehensive project-specific review on each application and require SSCs to assure that any potential significant adverse impacts from a particular project will be avoided, minimized, and mitigated to the maximum extent practicable, and that the USCs and SSCs achieve a net conservation benefit to any impacted threatened and endangered species.[508]

[508] FY 2025 New York State Executive Budget 12673-01-4, Renewable Action Through Project Interconnection and Deployment ("RAPID") Act, 129-167.

CHAPTER 7 | Unavoidable Adverse Impacts

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(iii)(b) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter analyzes unavoidable adverse impacts. Unavoidable adverse impacts are impacts that, if the proposed action is implemented, cannot be avoided or adequately mitigated. **Chapter 5** discusses the potential impacts that may result from implementation of the proposed action; that is, the common impacts of major electric transmission facility construction and operation. However, while adverse environmental impacts could result from individual projects implemented in the future, the purpose of the generic environmental impact statement (GEIS) is not to evaluate specific transmission or renewable energy projects and their individual impacts. Rather, this GEIS considers the impacts of the Article VIII regulatory program as a whole. The review presented in **Chapter 5** does not identify any unavoidable environmental impact of a type that cannot be mitigated through one or more of the techniques discussed in **Chapter 6.**

CHAPTER 8 | Irreversible and Irretrievable Commitment of Resources

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(iii)(c) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter discusses irreversible and irretrievable commitments of resources associated with the proposed action. The purpose of this chapter is to identify any natural, agricultural, and man-made resources consumed, converted, or otherwise made unavailable for future use as a consequence of the proposed action.

Promulgating the rules and regulations implementing the RAPID Act would not, in itself, result in irreversible or irretrievable commitment of resources. The proposed action does not include any approval of particular applications for the siting of major electric transmission facilities.

However, from a programmatic viewpoint appropriate to this GEIS, transmission facilities entail commitments of resources that are likely to be irreversible or irretrievable. The principal resource impacts of the construction and operation of transmission projects are described in **Chapter 5.** By requiring the utilities to provide the infrastructure necessary to support safe and adequate service, the Public Service Law recognizes that some such commitment is necessary to support the State's economy and the public welfare.[509] The existing electric grid represents an ongoing dedication of "natural, agricultural, and man-made resources," including the types of impacts discussed in this GEIS. To the extent the State's needs for expanded or new transmission lines require an additional commitment of such resources, the Article VIII USCs and site-specific requirements are designed to ensure that such commitments represent the minimum conversion necessary to meet the public's need for electric services. Specifically, the regulations establish criteria that will reduce or even eliminate possible adverse impacts related to the construction and operation of transmission facilities. For this reason, the proposed action will limit the future "irreversible and irretrievable commitment of resources" required to serve the State's electric system needs.

[509] PSL s 65.

CHAPTER 9 | Growth-Inducing Aspects and Socioeconomic Impacts

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(iii)(d) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter discusses the potential growth-inducing aspects and socioeconomic impacts of the proposed action. Specifically, the chapter proceeds through the following sections:

- **Section 9.1:** introduces the analytic framework for the analysis of growth-inducing aspects and socioeconomic impacts of the proposed action;
- **Section 9.2:** discusses the primary growth-inducing and socioeconomic impacts of the proposed action;
- **Section 9.3:** discusses the indirect growth-inducing and socioeconomic impacts of the proposed action;
- **Section 9.4:** describes how primary and indirect impacts may be distributed geographically, focusing on potential impacts to agricultural land, environmental justice areas, and disadvantaged communities.

9.1 Analytic Framework

This chapter provides qualitative information on the potential growth-inducing aspects and socioeconomic impacts associated with implementing the proposed action. As previously discussed, the exact transmission infrastructure that will be implemented under the proposed action is uncertain, and the overall infrastructure portfolio will not materially change. As such, this review is being conducted based on what is reasonably foreseeable.

Project-specific impact analyses will be required only when specific actions are proposed that trigger applicable federal, State, or local approval processes and that exceed thresholds that trigger site-specific environmental impact reviews. No specific projects resulting from the proposed action have yet been proposed. This chapter, therefore, does not attempt to predict or speculate on the possible impacts of project-specific actions. Rather, it focuses on descriptions of overall potential growth-inducing aspects and socioeconomic impacts of transmission projects generally. Further, as described in previous chapters, the RAPID Act by itself will not affect the volume or location of new transmission projects. Existing State climate and energy polices/legislation, namely the CLCPA and the Accelerated Renewable Energy Growth and Community Benefit Act (AREGCBA), together with basic infrastructure upgrades and utility capital plans, are the primary drivers behind the State's electric transmission and distribution (T&D) systems buildout. To the extent that the State's climate and energy policies influence this buildout, the underlying legislation and associated actions preceding the RAPID Act are the key factors. The proposed action, by accelerating development of the State's T&D systems, may contribute to the potential impacts discussed in this chapter.

9.2 Direct Impacts

The proposed regulations are expected to yield primary impacts through accelerating the permitting process for upgrades to existing transmission infrastructure as well as development of new transmission infrastructure. Expedited investments in existing infrastructure will increase grid capacity and resolve reliability issues faster than would occur absent the proposed action. A modernized grid will ensure New York businesses and residents continue to receive reliable electric service, and will leverage opportunities for economic development, at reasonable cost.

Similarly, the accelerated construction of new electric transmission infrastructure will support renewable energy development in a timely manner, ensuring renewable energy projects in the State can come online and connect to the grid. A faster clean energy transition in the State would in turn accelerate improvements in environmental,

public health, and other outcomes relative to actions in the regulatory baseline. Although construction, operation, and maintenance of the State's T&D systems contribute to the same impacts and public benefits under existing regulations, implementing the proposed regulations is intended to allow for earlier realization of these impacts and public benefits. Section 9.3 discusses the indirect growth-inducing and socioeconomic impacts of the proposed action associated with renewable energy adoption.

9.2.1 Transmission and Distribution System Reliability

The transmission of electricity serves two main functions: to integrate generation, and to serve load, primarily at the distribution level. Replacements of and improvements to existing, aging infrastructure are critical to meet future energy needs and alleviate congestion. Infrastructure upgrades promote growth-inducing and socioeconomic aspects pertaining to three main, related criteria: reliability, economics and employment, and addressing public policy objectives. A reliable electric system is the foundation of modern industrial economies. Maintaining the system is crucial for economic growth and job stability, especially in sectors that depend on continuous power like healthcare, technology, and manufacturing. Section 9.2 describes the economic and employment impacts associated with transmission projects. Section 9.3 discusses how the proposed action may contribute to growth-inducing and socioeconomic impacts associated with the achievement of the State's public policy objectives, namely CLCPA renewable energy adoption and greenhouse gas (GHG) emission reduction targets.

Reliability refers to the ability to operate the electric system within limits and without major interruption of service to consumers. Replacing or upgrading transmission infrastructure can prevent, or reduce the duration of, power outages associated with congestion, extreme weather events, and equipment failures.[510] Increased grid reliability will enhance the State's ability to adapt to the potential adverse impacts of climate change. As discussed in **Chapter 3,** various studies have documented the potential for climate change to contribute to sea level rise, storm surge, inland flooding, extreme precipitation, and extreme heat, factors which could challenge New York's existing electricity system. New investments may result in adoption of advanced technologies like automated monitoring systems and smart grid solutions, which can detect issues and reroute power more efficiently in the event of disruptions. [511]

Improved grid reliability benefits both utilities and customers. Poor reliability exposes consumers to power outages that affect communications, water, transportation, business, and health and safety.[512] From 2019 to 2023, excluding major storms, the State's electric utilities reported 77,000 service interruptions, or 9.52 interruptions per 1,000 customers served, per year on average. This resulted in 10.4 million annual customer-hours (the time a customer is without electric service). The average duration per customer affected (CAIDI) was 1.97 hours over the same five-year period.[513]

Power outages and lost electricity negatively impact utilities' operations and bottom lines. From 2000 to 2023, New York State lost an annual average of 5.5 percent of its total energy supplied – or 8.7 million MWh – through transmission loss.[514] Utilities incorporate basic upgrades to counteract energy losses into their capital

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[510] The resiliency of the grid refers to its ability to reduce the damages from power outages and shorten their duration.

[511] U. S. Department of Energy. Demonstration of Advanced Monitoring and Data Analytics of Power Transmission Lines. Accessed on November 19, 2024 at: https://www.energy.gov/sites/default/files/2022-12/DOE_OE_TRAC_Peer_Review_Project%20-%20LineVision_508.pdf *See also:* International Energy Administration. Smart Grids. Accessed on November 18, 2024 at: https://www.iea.org/energy-system/electricity/smart-grids.

[512] US FEMA. Preparedness Community, Power Outage | Impact. Accessed on November 20, 2024 at: https://community.fema.gov/ProtectiveActions/s/article/Power-Outage-Impact.

[513] New York Department of Public Service. 2023 Electric Reliability Performance Report. June 2024. Accessed on November 20, 2024 at: https://dps.ny.gov/system/files/documents/2024/09/70923690-0000-c613-bf9e-41b85aab90b2.pdf.

[514] EIA. State Energy Profiles, New York Electricity Profile 2023. Table 10. Source-Disposition. Accessed on November 18, 2024 at: https://www.eia.gov/electricity/state/newyork/.

plans, which together outline billions of dollars' worth of near-term transmission projects across the State (as discussed in **Chapter 2**). Utilities' spending during transmission projects' construction, operation, and maintenance phases promotes direct employment and wider economic activity, as described in Section 9.2.2 below.

9.2.2 Economic and Employment Impacts

Transmission projects drive additional spending in the economy, during both construction and maintenance, when local businesses benefit from increased demand for materials, services, and labor, and in the longer term through enhanced grid reliability.[515] Improved reliability increases productivity as businesses operate more efficiently with fewer disruptions, reducing downtime and operational costs.

Transmission infrastructure projects – potentially expedited by the proposed action – will create short- and long-term employment opportunities. New technologies will require high-skilled workers. The CLCPA Scoping Plan and Just Transition Working Group (JTWG) Jobs Study project strong growth for the transmission sub-sector.[516] Specifically, the Jobs Study forecasts 7,000 new jobs will be created in the transmission sub-sector by 2030 relative to 2019.[517]

New transmission projects necessitate a workforce to build and install new infrastructure. These projects require a diverse array of skilled labor, including engineers, electricians, construction workers, and project managers, leading to short-term employment opportunities with competitive wages and benefits.[518] Projects also provide long-term maintenance and operational positions. Once the construction phase is complete, the new infrastructure requires ongoing monitoring, maintenance, and upgrades to optimize performance and ensure reliability. These tasks create permanent jobs for skilled workers, most of which require specialized training and expertise in areas like software development, electrical engineering, and operations research.[519] These positions typically offer competitive compensation and benefits.[520]

As transmission construction projects often span several years and operation/maintenance creates long-term employment, stable employment promotes economic activity and growth at the local, regional, and State levels. Earlier realization of economic and employment impacts associated with transmission projects is beneficial.

More broadly, dynamic, innovative economies require reliable and efficient electricity delivery to meet demand. Upcoming energy-intensive investments in microchip manufacturing, data centers, and renewable energy projects across the State underscore the need for transmission and distribution systems to keep pace with economic activity.[521]

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[515] London Economics International. The Truth About the Need for Electric Transmission Investment & How Does Electric Transmission Benefit You. Accessed on November 18, 2024 at: https://www.eesi.org/files/021318_Julia_Frayer.pdf.

[516] New York State Climate Action Council. New York State Climate Action Council Scoping Plan. Accessed on November 19, 2024 at: https://climate.ny.gov/resources/scoping-plan

[517] New York State Climate Action Council. Just Transition Working Group 2021 Jobs Study March 2023: Vintage Update. Accessed on November 19, 2024 at: https://climate.ny.gov/-/media/Project/Climate/Files/JTWG-Jobs-Report-Update.pdf

[518] Urban Institute. Competency-Based Occupational Framework for Registered Apprenticeship. Accessed on November 19, 2024 at: https://www.urban.org/sites/default/files/2018/07/25/cbof_full_framework_transmission_lineworker.pdf

[519] BLS. Powering the Nation: Smart Grid Careers. Accessed on November 19, 2024 at: https://www.bls.gov/careeroutlook/2013/fall/art03.pdf

[520] *Ibid*.

[521] NYPA. 2024. Power Trends. The New York ISO Annual Grid and Markets Report. Accessed on December 4, 2024 at: https://www.nyiso.com/documents/20142/2223020/2024-Power-Trends.pdf.

9.3 Indirect Impacts

The proposed action interacts with the State's other climate and energy policies to promote renewable energy development in the State. As described throughout this GEIS, the anticipated difference between the proposed action and the "no action" alternative would be the pace of permit approvals for the same portfolio of transmission projects. Expedited approvals may accelerate the timeline of transmission projects themselves, allowing for timely connections to renewable energy sources. Similarly, expedited approvals may offer assurances and predictability to renewable energy developers awaiting project approval. By accelerating the State's transition to renewable energy, the proposed action is expected to contribute to the State reducing its reliance on fossil fuels. Prior SEQRA Analyses, including the Final Supplemental GEIS for the CLCPA[522] and the CLCPA Scoping Plan (the Scoping Plan),[523] have identified a number of impacts from large-scale renewable resources and distributed generation. For example, in terms of growth-inducing and socioeconomic aspects, the Scoping Plan estimated that new jobs driven by CLCPA investments are estimated to outnumber potential displaced jobs by a ratio of ten-to-one in 2030, with as many as 211,000 jobs expected to be created in growing sub-sectors by 2030, and 318,000 by 2040.[524]

9.4 Distribution of Impacts

This section considers the distribution of the proposed action's growth-inducing and socioeconomic impacts across the State. The nature of an impact, its burden on local communities, and the timing of its effects will vary by community, geography, and local economic and environmental conditions.

9.4.1 Geographic Distribution

Most of State's generation capacity is concentrated in upstate and western New York, while people and load centers are concentrated in southern New York. For example, 84 percent of total renewable capacity, or 10,085 MW, is located in western/upstate New York Independent System Operator (NYISO) Load Zones A-G.[525] In 2024, NYISO reported the State needs transmission projects capable of transmitting 4,550 MW from Canada and upstate New York to population centers downstate.[526] Some of these projects, like Clean Path NY and Champlain Hudson Power Express, are already in development.[527]

The existing flow of electricity from generation to load centers influences the distribution of impacts described in this chapter. Certain growth-inducing impacts may cluster in western/upstate regions, such as the employment and economic impacts resulting from the construction, operation, and maintenance of transmission infrastructure. Other impacts may be more measurable in downstate areas, if, for instance, reliability and efficiency improvements are more evident in high population density areas.

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[522] NYPSC. Final Supplemental Generic Environmental Impact Statement for the Climate Leadership and Community Protection Act. Accessed on November 19, 2024 at: https://pragmaticenvironmentalistofnewyork.blog/wp-content/uploads/2021/01/final-supplemental-generic-environmental-impact-statement-on-the-proposed-climate-leadership-and-community-protection-act.pdf.

[523] New York State Climate Action Council. 2022. New York State Climate Action Council Scoping Plan. Access November 19, 2024 at: https://climate.ny.gov/resources/scoping-plan.

[524] *Ibid*

[525] NYISO. 2024 Power Trends. Accessed on November 19, 2024 at: https://www.nyiso.com/documents/20142/2223020/2024-Power-Trends.pdf/31ec9a11-21f2-0b47-677d-f4a498a32978?t=1717677687961.

[526] *Ibid*.

[527] *Ibid*.

9.4.2 Impacts on Agriculture

Without proper protections in place for farmers, new transmission development could disrupt production on prime farmland and local economies dependent on agricultural activity (see Section 5.2.9). The proposed action grants ORES sole authority to issue permits for transmission lines alongside its current permitting responsibilities for wind and solar generation projects.[528] Upstate lawmakers have expressed concern that the RAPID Act would not adequately protect prime farmland.[529] Some safeguards to ensure that neither transmission nor generation projects unduly impact active agricultural are already in place, including the Farmland Protection Working Group, which is charged with developing strategies to minimize any adverse impacts of transmission and generation on viable agricultural land; the Agricultural Mitigation Fee applicable to all solar projects that receive a NYSERDA contract;[530] and a new statutory requirement introduced by the RAPID Act to develop uniform standards and conditions for the protection of productive agriculture.[531] These standards and conditions aim to protect agricultural activities and farmland by avoiding, minimizing, or mitigating significant adverse impacts to land used in agricultural production to the maximum extent practicable, with additional consideration for land within an agricultural district or land that contains mineral soil groups (MSG) 1 through 4.[532]

9.4.3 Environmental Justice and Disadvantaged Communities Impacts

Disadvantaged communities (DACs) have been disproportionally exposed to pollutants resulting from dependence on fossil fuel-powered generation. For example, New York City was powered by 85 percent fossil fuels in 2021, while renewable energy generated 91 percent of energy supply upstate.[533] A report from the NYC Mayor's Office of Climate and Environmental Justice specifically identified the lack of transmission lines as the reason for this imbalance.[534] Six percent of deaths annually in New York City are attributed to air pollution. PM2.5 and ozone pollution in the city results in more than 3,400 annual deaths, 2,800 cardiovascular hospital admissions, and 14,000 emergency room visits for asthma.[535] These poor health outcomes reduce workforce participation and increase dependency on social safety nets.[536]

Actions taken following implementation of the RAPID Act may occur in environmental justice (EJ) communities or DACs. **Chapter 3** reports the existing layout of EJ areas and DACs in the State. DACs have been systematically marginalized and overburdened by environmental burdens or climate change risks. In New York City, for example, 44 percent of census tracts are within regions identified as DACs, and approximately 30

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[528] NYS Focus. Clean Energy Transmission Battle Pits Speed Against Worker, Farm Protections. Accessed on November 20, 2024 at: https://nysfocus.com/2024/04/05/transmission-renewable-energy-transition-new-york.

[529] *Ibid.*

[530] NYSERDA. Update on the NYSERDA Agricultural Strategies and Agricultural Mitigation Fund. Accessed on November 20, 2024 at: https://www.greenegovernment.com/wp-content/uploads/2022/01/NYSERDA-Ag-Strategies-and-Ag-Mitigation-Fund-B.-Peterson-Presentation-1.21.22.pdf

[531] 16 NYCRR 1101-2.15.

[532] *Ibid.*

[533] NYC Mayor's Office of Climate and Environmental Justice. Systems. Accessed on November 18, 2024 at: https://climate.cityofnewyork.us/subtopics/systems/.

[534] *Ibid.*

[535] Mananga, E. S., Lopez, E., Diop, A., Dongomale, P. J., & Diane, F. (2023). The impact of the air pollution on health in New York City. *Journal of Public Health Research*, *12*(4), 22799036231205870. https://journals.sagepub.com/doi/full/10.1177/22799036231205870

[536] UBS. How nutrition impacts health—and the economy. Accessed on November 20, 2024 at: https://www.ubs.com/global/en/sustainability-impact/sustainability-insights/2023/how-nutrition-impacts-health-and-the-economy.html

percent of residents are considered energy insecure.[537] Of the census tracts in the Mid-Hudson region, 42 percent are within regions identified as DACs. Both regions are forecasted to host new investments in transmission infrastructure (**Chapter 2**). Although such projects are not known at this time, and the proposed action does not result in the approval of any specific projects, EJ areas and DACs may be disproportionately impacted by new transmission projects relative to other communities. As described throughout this GEIS, new transmission projects could result in both temporary environmental impacts to communities through which the transmission line will run (e.g., increased air emissions during transmission construction) and more sustained State-wide benefits (e.g., increased energy security, grid reliability, and connections to renewable energy sources). **Chapter 6** describes the mitigation measures in place to address any potential environmental impacts of the proposed action on DACs.

An accelerated transmission buildout and transition to clean energy can provide multiple growth-inducing benefits to DACs. DACs often have outdated infrastructure and limited connectivity, which can result in unreliable service or insufficient access to power. They may also lack the resources to recover quickly from power outages. Upgraded or new transmission infrastructure can better address connection issues to essential services like schools and healthcare facilities. In addition, functioning T&D systems are prerequisites for business activity and job growth.

[537] Columbia University. Survey Reveals Extent of Energy Insecurity in New York City. Accessed on November 20, 2024 at: https://www.publichealth.columbia.edu/news/survey-reveals-extent-energy-insecurity-new-york-city

CHAPTER 10 | Effects on the Use and Conservation of Energy Resources

Consistent with the regulations at title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) 617.9(b)(5)(iii)(e) implementing New York's State Environmental Quality Review Act (SEQRA), this chapter considers the potential impacts of the proposed action on the use and conservation of energy, including the use of renewable energy sources.

The CLCPA sets climate and clean energy goals, encompassing climate change impact adaptation, reductions in greenhouse gas (GHG) emissions, and investments in renewable energy technologies, as well as job creation and energy worker transitions and the protection of disadvantaged communities. As a result, the use and conservation of energy in the State is undergoing a transition facilitated by the CLCPA. Upgrading New York State's electric transmission and distribution (T&D) systems to integrate new renewable capacity and accommodate the forecasted growth in electricity demand in the State is part of this transition. The proposed action will influence the use and conservation of energy in the State to the extent that it leads to the accelerated development of the State's T&D systems. The proposed action will not impact the demand for energy and will instead support the State's ability to meet such demand. **Chapter 2** describes the drivers and forecasts of electricity demand and renewable energy capacity additions in the State.

This GEIS also addresses how the proposed action will contribute to the CLCPA's GHG emission reduction targets. Section 7(2) of the CLCPA requires State agencies to consider whether administrative decisions, such as permitting actions or the promulgation of regulations, are inconsistent with or interfere with the statewide GHG emission limits set by the law. The proposed action is a response to a legislative mandate. The New York State legislature designed the RAPID Act explicitly to timely achieve the renewable energy and GHG targets pursuant to the CLCPA.[538] **Chapter 5** explains that the proposed action is expected to accelerate GHG emission reductions in the State. **Chapter 6** describes how the regulations promulgated under the proposed action are designed to minimize or avoid potentially adverse environmental impacts that may result from implementation of the proposed action. For example, all applications for major electric transmission facility siting permits must include a statement, along with supporting documentation, demonstrating the degree of consistency of the construction and operation of the facility with CLCPA GHG emissions and other State energy/climate policies.[539] The uniform standards and conditions also include provisions to minimize air emissions during the construction of transmission facilities.[540] Given the impacts and mitigation measures analyzed in this GEIS, implementing the regulations adopted under Public Service Law Article VIII is not inconsistent, and will not interfere, with the statewide GHG emission limits set by the CLCPA.

[538] FY 2025 New York State Executive Budget 12673-01-4, Renewable Action Through Project Interconnection and Deployment ("RAPID") Act, 129-167.

[539] 16 NYCRR 1102-2.21.

[540] 16 NYCRR 1102-3.4.

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